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The Reliability of Self-Reported Drug Use Measured Through The Drug Use Forecasting Program: A Multi-Trait Assessment

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THE RELIABILITY OF SELF-REPORTED DRUG USE MEASURED THROUGH THE DRUG USE FORECASTING PROGRAM: A MULTI-TRAIT ASSESSMENT

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ABSTRACT

The majority of drug use data obtained by researchers thus far has been generated through the use of self-reports and urinalyses. In fact, such methods are often the only way to accurately identify individuals who use drugs. There has only been a minimal amount of research concerning the reliability of the self-reported drug use among arrestees in the Drug Use Forecasting (DUF) program. The purpose of this paper is to present initial evidence on the reliability of self-reported interview data when compared to urinalysis, and to give a detailed description of the variables associated with the accuracy of self-reports. The data were obtained from 2,400 arrestees in the Drug Use Forecasting (DUF) program in Omaha, Nebraska from 1987 to 1991. Analyses revealed that those who are non-white, felons, or who perceive a need for drug treatment are more apt to misrepresent themselves in the self-reporting of cocaine.

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INTRODUCTION

Few social issues have consumed the American public's attention more than drug use and drug related crime. News reports concerning crime and drugs have become common place within the news media, and the relationship between crime and drugs has become the focus of many political campaigns (Hunter, Marquart, and Cuvelier, 1992). Many public officials have responded with a policy of "zero tolerance" for any drug activity, and the position of Drug Czar was created to wage the "War on Drugs." The public's perception of the association between drugs and crime was demonstrated in 1989 when the Gallop Poll asked respondents, "What is the most important thing that can be done to help reduce crime?" The most frequent response (25%) was to cut the drug supply, whereas in 1981 only 3% of the respondents mentioned focusing on the drug supply (Bureau of Justice Statistics, 1992a).

This association between drugs and crime has also been reflected in the funding for drug enforcement, education, prevention, and treatment which has been growing at an unparalled rate. For the most part, these resources have been used to detect and arrest drug users and drug traffickers (Hunter et al., 1992). In the United States arrests for drug violations reported by state and local officials have increased by 144.6% for the sale and manufacturing of drugs since 1982, and arrests have increased by 25% for the

possession of drugs over the same time period (Bureau of Justice Statistics, 1992a). Because of this dramatic shift in arrests for drug related activities, other areas of the criminal justice system have been affected as well. The proportion of drug offenders in jail has increased 147% between 1983 and 1989. The proportion of drug offenders in the federal prison system has also grown, from 22% of all admissions in 1980 to 58 percent of all admissions in 1991. In addition, drug traffickers make up 26.1% of all state prison inmates, which makes them the largest segment of the state prison population (Bureau of Justice Statistics, 1992a).

Who are these drug users and how are they different from everyone else? National self-report studies estimate that the use of cocaine, heroin and marijuana is declining substantially among most segments of the U.S. population (NIDA, 1990). However, the Drug Use Forecasting (DUF) program has shown that this does not hold true for arrestees; DUF estimates show that approximately 50% to 85% of arrestees test positive for drug use (Tonry, 1990). In addition, Chaiken and Chaiken's (1982) findings illustrate that high levels of drug use are associated with high levels of criminal activity, whereas low levels of drug use are associated with low levels of criminal activity. This should be no surprise to researchers because there are literally hundreds of studies that have demonstrated the positive correlation between drug

use and crime (Eckerman, Bates, Rachel, and Poole, 1971).

One of the first and most complete studies addressing the connection between drug use and arrestees is that of Eckerman et al. (1971) in which they examined drug use among 1,800 arrestees in six major metropolitan areas: Los Angeles, Chicago, New Orleans, New York City, San Antonio, and St. Louis. The data were obtained from personal interviews, official records, and urine specimens. The refusal rate among the arrestees was surprisingly low at only 3%. Eckerman et al. (1971) discovered that 26% of the arrestees used at least one of the six drugs that were tested for through urinalysis (morphine, cocaine, codeine, methadone, amphetamines, or barbiturates). They also compared the "non-drug users" to the "drug users", and found that there was no indication that drug users were more likely than non-drug users to be arrested for violent crimes, although drug users were more likely to be arrested for serious property crimes. The Eckerman et al. (1971) study was unique in that the researchers were able to run a validity check by comparing the findings from the self-reports to those of the urine samples. They found that the agreement between the urinalyses and the self-reports was dependent upon the type of drug used and the crime for which the respondent was arrested. For example, there was a high correspondence between self-reports and urine specimens (82.8%) when the drug heroin was examined, while those who

tested positive for barbiturates, amphetamines, and methadone only reported use of these drugs approximately 30% of the time. The respondents who had tested positive for heroin and had been charged with a serious property crime (including robbery) denied the use of heroin in their self-report 68.2% of the time, and those who tested positive for barbiturates and had been charged with a serious property crime (including robbery) denied the use of barbiturates 56.8% of the time in the interview.

Unfortunately, while Eckerman et al. (1971) gathered data on the arrestees' age, education, race/ethnicity, marital status, and employment for the purpose of analyzing the relationship between drug use and socio-demographic characteristics, they failed to use these socio-demographic variables in their examination of the validity between self-reported drug use and urinalysis. Had they done so, this could have been used to shed additional light on those who had self-reported an abstinence from drug use, but later had their claims contradicted by urinalysis.

In the mid-seventies the study of the prevalence of drug use amongst arrestees was continued by File, McCahill, and Savitz (1974) in their study of 1,087 females arrested in Philadelphia. With the use of interviews, official records, and urine samples File et al. (1974) found that 20.9% of the arrestees were found to be "narcotics involved," (meaning that

they were found to have tested positive for narcotics in their urinalysis test), admitted to the addiction of narcotics in the pre-arraignment interview, or had a police record of either the sale or the possession of narcotics. Moreover, File et al. (1974) found that "narcotics involved" women were significantly more likely to be prostitutes (41%) than "non-narcotics involved" women (14%), leading the researchers to conclude that prostitution was used to produce income to support the drug use habits of women.

This finding was further examined by McBride (1976). When interviewing 5,993 arrestees in Dade County, Florida, he found an association between the type of drug used and the type of crime the individual was accused of having committed. More specifically, individuals who used heroin and cocaine were more likely to commit income producing crimes such as armed robbery and property crimes. Conversely, McBride (1976) found that 70% of crimes against persons were committed by non-drug users, thus finding that drug users are under-represented in non-income producing crimes.

In another effort to analyze trends in crime and drug use, Kozel and Dupont (1977) examined 44,233 people who were admitted to the Washington D.C. Superior lock-up as arrestees. Kozel and Dupont's (1977) findings were similar to those of Eckerman et al. (1971) in that approximately a quarter of the sample tested positive for amphetamines, methamphetamine,

codeine, barbiturates, cocaine, morphine, methadone, or phenmetrazine. In addition, 66 percent of those who were admitted into the jail and tested positive for "any drug use" were identified as being heroin users through urinalysis. The authors concluded that "generally, arrestees who were drug-positive were less likely to be charged with major crimes of violence than drug-negative arrestees" (Kozel and Dupont, 1977:18), and that those who were charged with property crimes were more likely to be using illicit drugs.

Chaiken and Chaiken's (1982) second inmate survey of 2,190 inmates of prisons and jails in California, Michigan, and Texas also found a relationship between drug use and type of arrestees. Chaiken and Chaiken (1982) characterized offenders into ten different "criminal varieties" based on the type of offense committed. In their report, they distinguished between violent predators and other criminal types based on the former's propensity to be high-rate offenders. Violent predators reported committing robbery, assault, burglary, theft, and drug dealing; these violent predators were distinguished from other offenders in that they were young, reported extensive juvenile criminal activity and drug use, had a poor employment record, and had reported a lack of family ties (Chaiken and Chaiken, 1982). In addition, violent predators were more likely to have used hard drugs, such as heroin and cocaine, and to have been daily drug users.

In a comprehensive review of the drugs and crime literature, Wish and Johnson conclude that researchers have "consistently found a strong association between the level of cocaine or heroin use and criminal behavior" (1986:59) and that both youths in the general population, and adult offenders who use these drugs, are more likely to commit serious crimes that generate income. Moreover, they state that "hard drug" use is an excellent indicator of a person who is likely to be engaged in high rates of criminal activity (Wish and Johnson, 1986).

VALIDITY AND RELIABILITY OF SELF-REPORTS

The majority of drug use data obtained by researchers thus far has been generated through the use of self-reports and urinalyses. In fact, such methods are often the only way to accurately identify individuals who use drugs, and are often useful in identifying the type and extent of drugs used, which is critical in exploring the relationship between drug use and crime. Since researchers' options are limited in the number of ways that this type of data can be obtained, it becomes important to examine the various types of errors that researchers are confronted with when using self-reported data and information gained through urinalysis (Skog, 1992).

In the past twenty years, researchers have seen an escalation in the use of self-reports as one of the primary

methods of data collection in the examination of deviant behavior. Self-reports developed out of the shortcomings of officially recorded data, which was often times under-reported, under-recorded, and biased by police practices (Glanz, 1990). In addition, researchers embraced this technique because of the many practical advantages, such as the ability to gather data on a large number of people in a relatively short amount of time, while at the same time keeping the costs down (Whitehead and Smart, 1972). However, as social scientists increase their reliance on self-reports, they need to address the many issues concerning the reliability and validity of such a method.

Because many researchers, including several cited within this work, use the terms validity and reliability somewhat interchangeably, it is important to note the definitions for these terms which will be applied in the discussion which follows. The definition of validity is complex, with at least nine types of validity: convergent, discriminant, content, face, predictive, construct, criterion, concurrent, and factorial (Weis, 1986).

The two types of validity that are most often discussed when comparing measures are convergent validity and concurrent validity. Convergent validity and concurrent validity "focus on the types of validity that allow the empirical assessment of the accuracy of responses" (Weis, 1986:12). Weis defines

convergent validity as, "the extent to which two or more measures intended to measure the same concept...produce convergent results" (1986:12). Weis (1986) further states that convergent validity is dependent upon concurrent validity. Concurrent validity "is defined as the degree of agreement between the test results and some other measure of the same thing that is obtained concurrently and that is generally regarded as valid" (Nurco, 1985:6).

One must keep in mind that when using the terms convergent and concurrent validity the researcher is explicitly stating that the criterion measure is the "truth" or that the ultimate reality is found within the criterion measure. Thus, convergent and concurrent validity do not permit the researcher to examine the direction of the error or the interaction of errors that may occur between the two measures. For example, there may be an error associated with the criterion measure (e.g. drug testing), and by blindly placing faith in the criterion measure we may mistakenly attribute a lack of validity to the self-report rather than to the criterion measure itself. Because it is often difficult to assess the validity of a criterion measure, this paper's interest lies in construct validity, meaning how well we are measuring the construct in question (i.e. drug use).

The definition of reliability can be operationalized two ways. The first is "whether a particular technique, applied

repeatedly to the same object, would yield the same result each time" (Babbie, 1992:135). Simply put, reliability within this context refers to the stability of the measurement over time. This is often measured through either the test-retest method or the split-half method. The test-retest method simply obtains a correlation between the original test and the repeated test. The split-half method obtains a correlation between two similar sections of a single application of the instrument (Babbie, 1992; Glanz, 1990).

Reliability may also be referred to as the consistency of results examined across measures. In other words, comparing the results of two instruments that are intended to measure the same object to see if they provide the same results. While this definition of reliability appears to be similar to convergent and concurrent validity, it does not imply or make the assumption that there is an ultimate truth found in either of the instruments, but rather permits the researcher to enhance their confidence in the instruments. Hereafter, use of the term reliability shall refer to "the consistency of results examined across measures" as discussed above. Thus, within the context of this paper the consistency between two measures, self-reported drug use and urinalysis, are examined to help assess construct validity.

Because self-reported data are subject to many possible errors which may affect their reliability and/or validity,

researchers using self-report instruments use different techniques to assess the amount of measurement error resulting from inaccurate reporting. This may be examined through the repeating of items in different parts of the questionnaire, or reliability may be checked by comparing the self-reported data with official reports. Researchers may also select a particular time period so that the respondent will be better able to accurately recall the information asked for (Weis, 1986). These techniques have aided researchers in identifying many of the types of errors discussed below which have become expected when using self-reports.

Sudman and Bradburn (1982) point out four major types of error found within self-reported data. The first is memory error, the unintentional forgetting of what, when, or how a particular incident happened. The second type of error is when the respondent intentionally under-reports or over-reports the information requested for either positive (social approval) or negative (fear of repercussions) reasons. The third is a communication error where the respondent does not understand what is being asked. The fourth type of error is a knowledge error, where the respondent may not know the answer but responds anyway.

Weis (1986) reports three major sources that may affect the validity and reliability of self-report data: interviewer characteristics, task characteristics, and respondent

characteristics. Interviewer characteristics fit into two categories, "role independent" such as gender, race, and age, or "role restricted" such as interview experience, interview style, and competence (Weis, 1986:16). Hindelang, Hirschi and Weis (1981) believe that while interviewer characteristics have an effect on self-reported data, such an effect is minor. They arrived at this conclusion after they found no differences in the validity of crime estimates when analyzing the relationship between role-independent characteristics (white male, black male, white female, and black female) and self-reports by looking at the interactions between interviewers and respondents who were randomly assigned to each other. While "role restricted" interviewer characteristics have not been extensively studied, the potential implications of such factors are obvious:

> "Well-trained interviewers have the potential for spotting and helping to correct mistakes made by respondents. Interviewers can be trained to execute complex questionnaire logic (skip patterns) much more accurately than respondents, and they can apply a set [of] uniform interpretations (of question terms, classification rules, time periods) across respondents" (Marquis, 1981:87).

Task characteristics include how the self-report is administered, how the self-report is worded, and if the self-

report is perceived as anonymous by the respondent (Weis, 1986). How the self-report is administered can be critical to the type of information that is going to be retrieved. If a researcher uses an anonymous questionnaire instead of an interview, the respondent may divulge more sensitive information, although with the use of an interview the researcher may be able to illicit more accurate answers by asking for more detailed information (Glanz, 1990).

Question wording is obviously an important factor in guarding against communication errors. Chaiken, Chaiken, and Rolph (1983) compared the first and second Rand inmate surveys to assess how question wording affects the estimation of offending rates. They concluded that the

> "differences between the first and second survey's results for robbery, assault and fraud can be attributed primarily to differences in wording on the survey instrument... and that [question wording] could account for substantial disparities in answers for some respondents" (Chaiken, Chaiken, and Rolph, 1983:19).

Lastly, Weis describes respondent characteristics as "any socio-demographic or personal attributes of a respondent [that may] affect [the] validity or reliability directly or indirectly..." (1986:17). He believes the impact of respondent characteristics on the validity of self-reports is

the most uncertain of the three major areas. Researchers have found that three particular characteristics may influence the validity and reliability of self-reports: ethnicity, socio-economic status, and chronic offending.

Hindelang et al. (1981) reported that black male delinquents are less likely to report offenses known to the police in self-report surveys than are other gender-ethnic groups. When researchers compared self-reports to official records, they found that on average, black males failed to report 33% of the offenses they had in their official records, whereas black females did not report 27%, white females did not report 15%, and white males did not report 10%. Further evidence of this pattern was displayed by Hirschi's (1969) study of 4,000 high school students in California. Of those who were asked the question, "Have you ever been picked up by the police?", 36% of the black males who had said they had never been picked up by the police had police records, while 16% of the white males who said they had never been picked up by the police had police records.

This pattern was also seen in Hindelang et al.'s (1981) examination of data gathered in Seattle, Washington. When looking at serious crimes such as burglary, robbery, auto theft, assault, and weapons offenses, 57% of black males failed to report that they had official records of this type, compared to 20% of white males. Conversely, when examining

less serious crimes such as minor theft and status offenses, the race effect seems to disappear (Hindelang et al., 1981).

Because the relationship between race and social class is so strong in America, any subject matter concerning the relationship between social class and crime needs to be wary of the "cloaked" relationship between race and social class (Steffensmeier and Allen, 1991). It may not necessarily be the individual's race that is a factor regarding the validity and reliability of self-reports, but rather his/her socio-economic status.

Hindelang et al. (1981) performed one of the most extensive reviews concerning the relationship between self-reports and social class, looking at the correlation between official data and self-reported data. Of the five major studies which they reviewed, all showed a consistency between self-reports and official reports (Reis and Rhodes, 1961; Hirschi, 1969; Williams and Gold, 1972; Wolfgang, Figlio, and Sellin, 1972; Elliott and Voss, 1974), leading Hindelang et al. to conclude that it

> "is apparent ... [that the] validity coefficients do not vary by socio-economic status..., and there is no consistent pattern in favor of one class over another. The general conclusion must be that self-report delinquency measures are as valid among lower-class as among middle-class white males"

(1981:195-196).

Consequently, the characteristic of race may have a major effect on the validity of self-reported data independent of socio-economic status.

Another characteristic that may affect the validity and reliability of self-reports is being a chronic offender. In Weis's examination of Chaiken and Chaiken's (1982) adult prisoner sample, he suggests that "Blacks, the less educated, drug dealers and users, alcoholics, and life-style criminals probably have less accurate, lower estimates of self-reported criminal involvement" (1986:28). This led Weis (1986) to assert that being a chronic offender contributes towards errors in self-reports.

A characteristic of chronic offenders which has been shown to have a negative influence on the accuracy of self-reports is the use of drugs at the time of the crime. For example, Weis contends that

> "a substantial proportion of ... [chronic offenders] will be under the influence of drugs at the time of the crime, and this will diminish their ability to encode and store information pertinent to the details and even the essentials of the event" (1986:29).

Many researchers especially question the validity and reliability of self-reported data when the information that is

being asked is "labelled as deviant or illegal" (Becker, 1963:168). Since surveys of drug use are heavily dependent upon self-reports, establishing the reliability and validity of this information is of the utmost importance (O'Malley, Bachman, and Johnson, 1983).

There are two forms of inaccurate reporting with self-reports of drug use; false positives and false negatives. False positives occur when the respondent reports having used a drug when in fact he/she has not. This may occur through a misunderstanding, a slip of a pen, or simply be due to lying (Skog, 1992). Researchers have concluded that false positives are not a serious problem, as they occur less than one percent of the time (Skog, 1992; Barnea, Rehav, and Teichman, 1987).

False negatives occur when the respondent reports that they have not used a drug when in fact they have. Clark and Tifft (1966) performed one of the first examinations of the reliability of self-reported drug use and other deviant acts. Their study was designed to test the accuracy of a confidential questionnaire by cross checking the answers through the use of a polygraph. Their respondents were 45 male sociology students. The results showed that the overall error rate was fairly low, with 19.5% of the responses being inaccurate. In addition, the question that referred to the respondent's illegal drug use was found to be inaccurate only 5% of the time, although the authors stated that problems with

understanding the meaning of this question arose.

Ball (1967) was one of the first to assess the reliability and validity of self-reports exclusively with known drug users. His sample consisted of 59 Puerto Rican narcotics addicts. Ball (1967) compared self-reports to administrative records, official records, and urine samples. When comparing self-reports to urinalyses, Ball found that 92% of the respondents' reports of current drug use were valid. He attributed the excellent consistency of the respondents' self-reports with urinalysis to prior institutional contact, the use of personal interviews, and an interviewer who was an expert at interviewing in the Puerto Rican slums.

Amsel, Mandell, Matthias, Mason, and Hocherman (1976) also looked at the reliability and validity of self-reported drug use among narcotics users, but did not find as much consistency as Ball (1967). Amsel et al. (1976) used a sample which consisted of 1,500 persons who applied to the National Institute for Mental Health (NIMH) civil commitment program. When comparing self-reports to urinalyses, the study revealed that 74% of the responses were found to be truthful, while 17% were found to be false negatives. The remaining 9% were reported as "unclear" because of problems with the urinalyses.

Amsel et al. (1976) also compared those respondents who provided urine after the self-report to those who did not provide urine. They found that those who did not provide

urine reported a lower frequency of drug use when compared to those who had given urine. They reported that "forty-five percent of [those who did not give a specimen] reported no drug use compared to 41 percent of those who gave urines" (Amsel et al., 1976:334), although this was not reported as a significant difference.

One of the most extensive studies on this issue to date is Falck, Siegal, Forney, Wang, and Carlson's (1992) examination of the validity of self-reports among injection drug users. Falck et al. (1992) sampled 128 injection users who had participated in an AIDS prevention program. This project is unique because, while it cross-checked the self-reports with urinalyses as other studies had in the past, it also examined the variables which were correlated with false reporting. Falck et al. (1992) concluded that 21.1 percent of those who had reported no drug use had in fact tested positive for drugs by urinalysis. When using logit regression to control for race, gender, education, drug treatment, age, and drug choice, their analysis revealed that those who were black, whose primary choice of drug was crack, or who injected cocaine, were significantly more likely to have misrepresented themselves in the self-report. In addition, when examining the sample by age, there was a "strong trend" among subjects 30-39 years old to under-report drug use (Falck et al., 1992).

VALIDITY AND RELIABILITY OF URINALYSIS

Many of the studies reviewed above have used both self-reports and urinalyses, and while they have given proper attention to the limitations of self-reported data, there seems to be a lack of literature in the social sciences concerning the use of urinalysis reports themselves. It should not be assumed that these biochemical tests are perfectly valid.

From a historical point of view, drug testing evolved from the medical technology of the 1960's (Bureau of Justice Statistics, 1992b). It was used for doctors to analyze the level of drugs that they had administered in a patient's body. Urine testing then rapidly increased in the 1960's and 1970's due to the criminal justice system's use of it for routine drug testing, and the U.S. military's use of it to test soldiers returning from Vietnam. In the 1980's drug testing expanded further due to the rising intolerance of drug use under the Reagan administration. One of the most successful drug testing policies was initiated in the United States armed services in 1981 when the use of urinalyses was begun to deter and detect drug use among its personnel. Drug use fell in the armed services from 28% in 1980 to 5% in 1988 (Bureau of Justice Statistics, 1992b). Based partly on this decrease, drug testing has been touted as an effective means of curbing drug use.

One of the most established urinalysis methods for detecting drug use is enzyme immunoassay (EMIT). EMIT uses "proteins that will react only with a specific substance or group of very similar substances, to detect the presence of drugs" (Bureau of Justice Statistics, 1992b:118). EMIT is often used because it is a cheap and quick test that can be done in large volume (Bureau of Justice Statistics, 1992b). For example, portable machines may be used that perform tests in high volume with the cost ranging from 1-5 dollars per test. In addition, only a minimal amount of training is needed to run the machine, which is the reason why some facilities have established on-site testing (Wish and Gropper, 1990).

When using EMIT, however, one needs to recognize that it is to be used only as a screening test. Many facilities use a confirmation test, such as gas chromatography/mass spectrometry (GC/MS), to confirm a positive result established by EMIT, because EMIT is restricted in terms of sensitivity and specificity. Sensitivity is the drug test's ability to detect the drug in question; the more sensitive the test the further back in time a drug can be traced. Specificity is the drug test's ability to differentiate between similar substances. For example, EMIT can detect classes of drugs (e.g. opiates), but is unable to differentiate between particular drugs (e.g. codeine and morphine) (Bureau of

Justice Statistics, 1992b).

With the public tending to have blind faith in medical technology, it is important that urinalysis be an accurate measure of drug use; thus, we need to understand the types of error that may occur with such tests (Rosen, 1987). Blanke (1986) cites two forms of error that typically take place; human error and errors in methodology. The first type of error often occurs because of fatigue and boredom on the part of the technician on the job, or it may result from poorly trained personnel. However, the most often cited human errors are administrative errors, such as labeling, spelling and transportation problems which can lead to relinquishing the wrong results to the wrong person. Errors in the methodology may also occur. Blanke (1986) reports that the EMIT procedure may yield a false-positive due to a "cross-reaction" to a non-specified substance. Blanke (1986) gives several instances where this may occur: an antihistamine diphenhydramine may be detected as methadone; ibuprofen may be detected as marijuana; labetalol may be detected as amphetamines; and herbal teas may be detected as cocaine. Blanke (1986) suggests that laboratories need to retain positive specimens so that they may be retested by an appropriate confirmation test such as gas chromatography/mass spectrometry (GC/MS).

GC/MS is probably the most sensitive and specific test available today (Wish and Gropper, 1990). GC/MS "is a method

of chemical analysis in which substances in a sample...are separated by extracting or causing them to attach to some type of material or particles" (Bureau of Justice Statistics, 1992b:118). Since gas chromatography with mass spectrometry (GC/MS) is often considered the most conclusive form of drug testing available, it is often used as a check to confirm a positive screening from an EMIT test. Wish and Gropper state that the identification of a drug with this instrument is analogous to a fingerprint of a person; each drug leaves a very specific and distinctive identification pattern, "thus, GC/MS is considered to be the absolute standard for identifying drugs" (1990:343). One disadvantage of GC/MS is that it is an extremely time consuming process to prepare the specimen for testing. This type of testing also usually requires a large commercial company that can afford all of the technical equipment along with the expenses of a fairly lengthy training process (Wish and Gropper, 1990).

Even with the GC/MS confirmation test, many other factors such as drug type and frequency of use may determine whether a drug test result will be negative or positive. Different drugs take different amounts of time to clear through the body's system; for instance, the average time that cocaine is detectible in the urine is 2-3 days, marijuana 3-10 days, opiates 2 days, PCP 8 days, amphetamines 2 days, and barbiturates 1-7 days (Bureau of Justice Statistics,

1992b:119). Thus, cocaine is only detectible to a urinalysis for a short amount of time, whereas PCP moves through the body slowly, and is therefore detectible to a urinalysis for a longer amount of time. Frequency of use also determines whether or not a drug may be found to be present through urinalysis. For example, if a person only uses marijuana once, it is only detectible within three days, whereas if a person uses marijuana daily it is detectible up to ten days later (Bureau of Justice Statistics, 1992b).

One must keep in mind that a positive test result only means that the specimen has tested positive for a specific substance that is present in the person's urine (Bureau of Justice Statistics, 1992b). It does not mean that the person was under the influence of the drug when tested (Manno, 1986). Similarly, if a person tests negative, it does not mean that they had never used drugs. Rather it can mean one of three things: 1) the subject may not currently be using the drug which is tested for; 2) the respondent may be using drugs but they are taking too little to be detected by the test; or 3) the person's urine was tampered with (Manno, 1986).

The points raised above were illustrated by Darke, Heather, Hall, Ward, and Wodak (1991) in their analysis of 290 opiate users. While their conclusions were similar to many of the validation studies cited above, they found an unusually high rate of false-positives. For instance, 88.7% of the

self-reports agreed with the urinalysis, which is consistent with past literature, but 73.5% of those whose self-report and urinalysis did not agree were a result of the self-reported use not being detected by the urinalysis. In only 3% of the cases was a drug found in the urinalysis which was denied in the self-report.

A similar study was done by Visher (1991) in which she examined the accuracy of different urinalysis technologies. She used 2,400 parolees and 198 arrestees in California to compare the screening test EMIT to the confirmation drug test GC/MS which is considered the most accurate method for identifying drugs (Wish and Gropper, 1990). Visher found that the false negative rate for marijuana was an astonishing 29%, although the false positive rate was only 2.1%. Similar results were found for the drug cocaine in which the false negative rate was 22.8%, but the false positive rate was only 2.5%. In other words Visher (1991) found that the EMIT test often times (about 2%) identified the urine specimen as negative, when in fact the urine specimen should have been identified as positive.

ESTIMATES OF DRUG USE IN THE UNITED STATES

Because of the importance of information regarding drug use in the United States, trends of such use are monitored through four national survey instruments: the National

Household survey on Drug Abuse (NHSDA), the High School Senior Survey, the Drug Abuse Warning Network (DAWN), and the Drug Use Forecasting (DUF) program. Such surveys are important to policy makers because they provide the means to estimate the drug use problem in the United States.

National Household Survey

The National Household Survey on Drug Abuse (NHSDA) is a large, nationally representative survey of the U.S. household population aged twelve and over. It has provided data on the prevalence of cigarette use, alcohol use, and the use of illicit drugs since 1972. In particular, it "provides information about the pattern of use, problems resulting from use, and perceptions of the harmfulness of using illicit drugs, alcohol, and cigarettes among members of the U.S. household population" (NIDA, 1990:1). Respondents in this survey are interviewed in person, in their homes, by trained interviewers. This survey's strength is that it reports much of the drug use that takes place in the general population that often times is not reported to administrative, medical, or correctional authorities (NIDA, 1990). In addition, it gathers data on the respondents' socio-economic and demographic characteristics such as age, sex, ethnicity, geographic region of residence, education, and employment status. It also attempts to increase the validity of the

estimates by over-sampling such groups as Blacks, Hispanics, those under 35 years of age, and those living in rural areas (NIDA, 1990).

While the NHSDA is an excellent resource, researchers cite many limitations pertaining to the validity and reliability of the data gathered. The most often cited limitation is that certain subpopulations are excluded from the sample. As Wish and Gropper state,

> "while this survey does include more than 98 percent of the U.S. population, it excludes persons living in group quarters or institutions such as military installations, dormitories, hotels, hospitals, and jails and transient populations such as the homeless" (1990:332).

While Wish and Gropper's (1990) statement reports that the National Household Survey includes 98% of the United States' population, they actually meant to say that the National Household Survey is representative of 98% of the United States population.

In a caveat to the main findings of the National Household Survey, it is stated that if the drug use of these under-represented groups should differ from the general population, the estimates derived from this survey are likely to be inaccurate, especially as pertains to the prevalence estimates of rarely used drugs such as heroin (NIDA, 1990).

In fact, this does seem to be the case, in that there is a high degree of correlation between drug use and stigmatized individuals such as criminals, transients and the homeless (File et al., 1974; McBride, 1976; Dembo, Williams, Wish, and Schmeidler, 1990; Eckerman et al., 1971; Amsel et al., 1976).

In addition to these problems, the NHSDA falls prey to a common problem found in all self-report surveys in that the value of these surveys is entirely dependent upon the truthfulness and memory of the respondent. This is a problem particularly with the NHSDA because the survey is cross-sectional and not longitudinal. That is, respondents are interviewed once, measuring an overview of the individual's drug use at a specific point in time. This provides for no means of cross-validating the information that has been given to the interviewer, such as a pre and post test to check the reliability of the respondents' self-reports (NIDA, 1990).

High School Senior Survey

The second survey used to estimate the amount of drug use in America is the High School Senior Survey which administers a self-report survey to 16-18 thousand high school seniors in about 125 public and private high schools selected throughout the United States. The questionnaire is usually administered by interviewers during school hours in one of the students' regularly scheduled classes. The interviewers instruct the

students that the survey is completely voluntary and that they may leave any question blank that they feel could be interpreted as inappropriate by either themselves or their parents (Bachman and O'Malley, 1981). The purpose behind the High School Senior Survey is to enable researchers and policy makers to gain a more accurate picture of drug use tends among high school youth in the United States (Johnson, Bachman, and O'Malley, 1977).

While this survey does target some of the population that the NHSDA misses, it still excludes individuals who have dropped out of high school. It is estimated that between 15% to 20% of students drop out of high school before graduating (Wish and Gropper, 1990). This is important because we know that illicit drug use is more prevalent amongst high school drop outs (Johnson, 1973).

Johnson et al. (1977) pointed out three additional ways in which there may be validity problems with the data from the High School Senior Survey. First, depending on the year, 20% to 34% of the schools that are selected to participate in the sample refuse to participate; this could introduce bias into the process. For example, it has been noted that schools with "drug problems" have refused in the past to participate in this survey (Johnson et al., 1977).

Secondly, 25% of the students do not complete the questionnaire. The most frequently cited reason for refusing

to participate was that the student was absent from class that day, and the survey is not usually administered at an alternate time for these students. Johnson et al. (1977) note that students who are often times absent also report high rates of drug use; thus a bias is likely to exist regarding who completes the questionnaire.

Lastly, Johnson et al. (1977) state that this survey, much like the NHSDA, is entirely dependent on the respondents to report illegal drug use. When this issue is examined by researchers it is difficult to ascertain the validity of the students' responses because there is no built in measure to cross-check the data, such as official police reports, lie detector tests, urinalysis tests, or repeated questions within the questionnaire.

Bachman and O'Malley (1981) have examined the issues surrounding the validity and reliability of the Senior High School Survey. In their analysis of the high school senior classes of 1976 through 1979, Bachman and O'Malley (1981) found that the respondents' reported drug use within the last month was often inconsistent with the respondents' reported drug use within the past year. Thus, either the annual frequencies were under-reported or the monthly frequencies were over-reported by the students.

In addition to the limitations listed above, researchers have theorized that the less tolerant society is towards

drugs, the less likely it is that respondents will report drug use in a self-report survey. For example, the High School survey asks whether or not the respondent would report drug use if they had ever used an illicit drug. Wish and Gropper (1990) state that a significant number of the black seniors indicated that they would not report using an illicit drug on the survey even if in fact they had used the drug. More specifically, 22% of the black respondents stated that they would deny using heroin even if they had used the drug, and 17% of the black respondents stated that they would deny using marijuana even if they had used the drug. Wish and Gropper (1990) did not provide similar information relating to white students.

Drug Abuse Warning Network

The third form of national drug estimation is the Drug Abuse Warning Network (DAWN) which is sponsored by the National Institute on Drug Abuse and the Drug Enforcement Agency. The National Institute on Drug Abuse (1975) cites four specific purposes behind this project: 1) the identification of drugs that are being abused by individuals; 2) the examination of patterns and trends of known drugs and new drugs being introduced into the population; 3) the collection of data that assesses the potential harm of specific drugs on individuals; and, 4) the collection of data

to control and schedule drugs.

DAWN data is collected from hospital emergency rooms and from county medical examiners in 27 cities across the United States. National estimates are then generated by a DEA-developed mathematical model from these data (DEA fact sheet, 1988). The data collected include demographic information on the patient or the decedent and information concerning the substance used and the circumstances surrounding the situation (DEA fact sheet, 1988). DAWN provides information on chronic drug users by reporting drug overdoses and by noting any drug related incidents which involve individuals who are admitted through an emergency room or medical examiner. The survey is useful in that it picks up individuals whom the first two estimation models miss by virtue of the collection method used.

While DAWN is not prone to the many limitations that self-reports are, there are some obstacles related to it. First, since there are no records kept attesting to the identity of the individual, the number of episodes reported should not be construed as being synonymous with the number of individuals being examined in the emergency room, since one person may be treated twice in the emergency room for a drug related incident (Bachman, Johnson and O'Malley, 1980). Secondly, these data are limited to situations that require a medical emergency; thus, the person has to have been admitted

to a hospital or taken to a medical examiner (Bachman, Johnson and O'Malley, 1980). Because of the foregoing limitations, the data collected cannot be taken as an estimation of drug abuse in the United States as a whole, but rather should be regarded as an indicator of drug abuse within the population from which the data has been retrieved (Bachman, Johnson and O'Malley, 1980).

Drug Use Forecasting Program

The final form of estimating the amount of drug use in the United States which will be discussed here is monitored through the Drug Use Forecasting (DUF) program. In 1987, the National Institute of Justice (NIJ), in cooperation with the Bureau of Justice Assistance, implemented DUF in twelve cities as a national system for tracking drug use among arrestees. Since its inception in 1987, the DUF program has grown to 24 cities. The DUF program collects data through anonymous self-reports and urine samples from arrestees. Each city collects self-reports and urinalyses from approximately 225 males in a two to three week period each quarter (National Institute of Justice, 1992).

The DUF program interviews request a great deal of personal information such as age, race, employment, education, income, sex practices, drug use practices and habits, and HIV risk factors (Decker, 1992). All urine specimens are tested

by EMIT for cocaine, opiates, marijuana, PCP, methadone, benzodiazepines, methaqualone, proxyphene, barbiturates, and amphetamines. Any positive results for amphetamines are confirmed by gas chromatography to eliminate any false positives generated from an over-the-counter-drug (National Institute of Justice, 1992). The information gathered from this survey is by far the most detailed and complete of the four drug use indicators discussed thus far, because it provides all the in-depth information that is gained by the use of self-report data and uses urinalyses to cross-validate the information concerning drug use.

Decker (1992) has provided the most comprehensive review of the methodological limitations of DUF. Decker (1992) begins by addressing the issue of sampling. He reports that many researchers in the past have claimed that there is a built in sample bias in the DUF data collection method because it screens arrestees to establish who is eligible to be interviewed, and that the requirements of the screening are different for men than they are for women. For example, DUF procedures instruct interviewers, when they have the choice, to select the arrestees by charge beginning with non-drug felonies first, non-drug misdemeanors next, then drug felonies, and finally drug misdemeanors. Because of the limited number of women who are arrested, women are asked to participate in the study regardless of charge (Wish and

Gropper, 1990). Decker (1992) further explains that this sampling methodology has led to controversy over the representativeness of the sample, because one of the key goals of DUF was to be able to generalize these findings to the entire arrestee population.

Decker (1992) examined the criticisms cited above concerning the representativeness of the DUF sample by comparing the St. Louis Police Department's official arrestee data (N=26,892) to DUF data collected in St. Louis (N=2,639). When examining males, he found that the DUF data were almost identical to the St. Louis police department data across offense categories. As Decker states, "For ten of the thirteen offense categories, the differences between the percent of all cases accounted for by a given offense for official and DUF data is less than two percentage points" (1992:28).

When Decker (1992) examined these same relationships amongst women, he found that the arrest data and the DUF data corresponded just as strongly as they had for males. Decker concluded that "this finding lends confidence, at least in St. Louis, to the notion that the DUF data are representative of overall arrest patterns, and can [be] reliably used to make inferences about the larger population of arrestees [in St. Louis]" (Decker, 1992:29).

As stated earlier, drug use estimates generated by the

DUF program are many times greater than the estimates of the NHSDA and the High School Senior survey which attempt to measure the drug use of the general population. In Wish and Gropper's (1990) extensive review of drug testing in the criminal justice system, they conclude with the following questions:

> "Would the estimates of drug use in the household or high school survey be closer to those from arrestees if drug use were measured by urine tests rather than self-reports?...How can the estimates of drug use in arrestees be incorporated in national estimates of drug use?" (1990:381).

Up to this point there has only been a minimal amount of research concerning the reliability of self-reported drug use utilizing the DUF data as suggested by Wish and Gropper (1990). Rosenfeld, Decker, Blatner, Diamond, and Reichard (1993) analyzed data from 28,000 DUF arrestees in 24 cities. The authors particularly compared the validity of time bounded and unbounded self-reported drug use with urinalysis to see which method is more consistent in determining if the respondent is currently using drugs. Time bounded is defined by the authors as asking the subject through self-report if they had used a specific drug within the past 72 hours, whereas unbounded is simply defined as asking the subject through self-report whether they had ever used a specific drug

in their lifetime. Rosenfeld et al. (1993) found that the more restricted the time frame, the more accurate the self-report. More specifically, they found that "over 90 percent of arrestees who report cocaine use during the prior 3 days test positive for cocaine compared with 60 percent of those reporting lifetime use" (1993:8).

Rosenfeld and Decker (1993) used cross-sectional data from 13 DUF sites and longitudinal data from the St. Louis DUF program to compare the cocaine use among arrestees through the use of self-report and urinalysis. When comparing the 13 cities, they reported that "cocaine use was under-reported by sizable margins in all cities, in most cases by a factor of two ... and the percent with a positive urine test for cocaine (UT), was fairly stable across the cities" (Rosenfeld and Decker, 1993:224). They also reported that there is a strong relationship between self-reported cocaine use and urinalysis (r=.91) (Rosenfeld and Decker, 1993). Thus, they were able to detect drug use through urinalysis about as well as if they had used self-report data.

Like the cross-city comparisons, the longitudinal results when comparing self-reports to the urinalyses were found to be highly correlated over time (r=.92) (Rosenfeld and Decker, 1993). Rosenfeld and Decker state that this "strong relationship between the two measures enabled very precise estimates of the percentage of arrestees who tested positive

for cocaine each quarter" (1993:27). They concluded that these results may aid researchers in reducing their reliance on drug testing to estimate drug use in various populations (Rosenfeld and Decker, 1993).

While Rosenfeld et al. (1993) and Rosenfeld and Decker (1993) focused on the issues of the validity of self-reported drug use, neither examined particular demographic characteristics that may affect validity. In fact, Rosenfeld and Decker suggest that "An important objective for further research using the DUF data is to identify the factors that influence the validity of individual arrestees' reports of use of cocaine and other drugs" (1993:227). While Rosenfeld and Decker make reference to the "validity of ... arrestees' reports" (1993:227), upon closer examination I maintain that they were actually referring to the reliability, as I defined this term earlier, between the arrestees' self-reports and urinalysis.

THE PRESENT STUDY

This brings us to the purpose of this thesis, which is to present initial evidence on the reliability of self-report interview data obtained from arrestees in the Drug Use Forecasting (DUF) program, and to give a detailed description of the variables associated with the accuracy of the DUF self-reports. The information provided on the reliability of self-

reported arrestees' drug use may aid in the estimation of drug use trends in the general population by identifying the variables which are associated with false reporting.

Most prior studies examining the reliability of self-reported drug use among arrestees have not focused specifically on the variables that may be associated with false reporting (Eckerman et al., 1971; File et al., 1974; McBride, 1976; Kozel and Dupont, 1977). As stated previously, an exception is Falck et al.'s (1992) research on injection users in an AIDS prevention program. Their sample may have been biased, however, due to its being limited to those who had already acknowledged being an injection drug user by virtue of participating in the prevention program. Furthermore, the variables used in Falck et al.'s (1992) analysis were limited to only the most basic socio-demographic characteristics such as race, age, and education, whereas the data collected through the DUF program contains information on interviewer characteristics and situational factors, as well as the socio-demographic characteristics of the respondent.

Unlike Falck et al. (1992), this thesis uses a sample of arrestees. While researchers know that this population is more likely to use drugs than the general population (Wish and Gropper, 1990), the respondent has not specifically acknowledged using drugs as was the case in Falck et al.'s (1992) research.

DATA COLLECTION

Data for this thesis was previously collected by the Omaha Drug Use Forecasting (DUF) project, as part of a nationwide research effort sponsored by both the National Institute of Justice (NIJ) and the Bureau of Justice Assistance (BJA). Since 1987 the DUF program has grown to 24 cities, and the information gathered is used to forecast national drug use trends among arrestees and to aid local communities in allocating law enforcement and drug treatment resources (Regier, 1989).

The DUF program consists of the quarterly collection of arrestee questionnaires administered by an interviewer. The questionnaire covers information concerning demographics, self-reported past and current drug use, substance abuse treatment history, most serious charge at arrest, and AIDS risk behaviors. In addition to the self-report, the DUF program obtains urine specimens from willing respondents after the interview has been concluded (Regier, 1989). A copy of the DUF interview form appears in the Appendix.

The interviewing process takes place at the Omaha site according to a specific procedure. Initially all males arrested in Omaha are brought to the central booking facility. The booking facility has holding cells designed to detain arrestees for 72 hours. The interviewer obtains a list of all individuals in the holding cells, which includes the

prisoners' names, social security numbers, and charges. The jailer then goes to the individual cell where each prisoner is located and brings the respondent to the interviewer. Interviews take place in a private interrogation room set aside for this purpose, located outside of the individual's jail cell. In addition, the interviewer tells the prisoner that participation in the project is voluntary, and that all the information collected is confidential and is coded by an ID number which cannot be traced back to the individual. If the individual agrees to participate in the self-report, the interviewer determines the most serious charge for the arrestee and records this on the self-report form. Depending on the respondent's willingness to participate in the survey, and their drug history, the interview lasts approximately 10 to 25 minutes. After the interview is completed, the respondent is asked if he would provide a urine specimen. If the prisoner agrees, he is given a plastic bottle that is labeled with an ID matching the one on the questionnaire, and is shown to a portable toilet within the same room. At this time the interviewer leaves the room and the respondent goes behind a temporary wall where the portable toilet is located. Precautions are taken by the interviewer to ensure that the urine in the bottle is in fact that of the respondent. One of these precautions is that the liquid in the portable toilet is dyed blue so that the respondent can not dip the bottle into

the portable toilet to obtain his sample. In addition, the interviewer feels the bottle to ensure that the specimen is still warm. The collection period for all subjects is 21 days, or until a sample of approximately 225 male arrestees has been processed, which ever occurs sooner (Marshall and Webb, 1993).

All urine specimens from the 24 DUF sites are sent to a central laboratory for analysis. The urine specimens are analyzed by a process known as Enzyme Multiplied Immunoassay Testing (EMIT). EMIT identifies cocaine, opiates, marijuana, PCP, methadone, benzodiazepines, methaqualone, propoxyphene, barbiturates, and amphetamines. Any positive result for amphetamines is confirmed by Gas Chromatography Testing (GCT), which is used to eliminate any false-positives caused by an over-the-counter drug in the arrestee's system. The urinalysis detects the use of most drugs in the past two to three days (Bureau of Justice Statistics, 1992b). One exception is marijuana. Marijuana can be detected up to three days after use if the person uses marijuana moderately (four times or less per week). However, marijuana can be detected up to 27 days later if the person uses marijuana heavily (daily) because marijuana can be stored in "fatty" tissue (Bureau of Justice Statistics, 1992b).

The interview questionnaires are then sent to NIJ in Washington, DC where they are merged with the urinalysis

results. An SPSS-X system file is created and stored on the PROfessional CONFerence (PROCONF) electronic bulletin board system from which the users download the data for analysis (Swartz, 1990).

SAMPLE

While most DUF site procedures instruct interviewers to select the arrestees by charge, Omaha, Nebraska is an exception to this rule, as Marshall and Webb explain:

> "In Omaha nearly all adult male arrestees are eligible for inclusion in the sample. This means that in Omaha, certain traffic offenders as well as non-traffic misdemeanants are included in the DUF sample in addition to the felons. Omaha first became an active DUF site in July of 1987, and after an initial, pilot effort, the site was dormant until the second quarter of 1990. Since that time, data collection has taken place each quarter" (1993:10).

Due to the low volume of women and juveniles who are arrested in Omaha, such arrestees are excluded from participating in the DUF program, leaving a total sample size of 2,400 DUF adult male arrestees from 1987 to 1991.

VARIABLES

The two dependent variables to be used in these analyses measure whether the arrestee's self-report survey responses are consistent with his urinalysis. A dummy variable will be created by cross-checking the urinalysis test with the respondent's self-reported marijuana use within the last 72 hour period ('Mj_no_match'). This variable will be used to assess the veracity of the use of a relatively soft drug (marijuana). In addition, a second dummy variable will be created by cross-checking the urinalysis test with the respondents' self-reported cocaine[1] use within the last 72 hour period ('Coc_no_match'). This variable will be used to assess the veracity of the use of a relatively hard drug (cocaine).

There are three different possible outcomes for each of these variables: 1) the arrestee denies drug use but the urine is positive, 2) the arrestee self-reports drug use but the urine is negative, or 3) the arrestee's self-report and urine match.

The dependent variable for the drug marijuana was created by cross-checking the urinalysis test with the respondent's self-reported marijuana use within the last 72 hour period.

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[1] When referring to the drug cocaine, in this paper, the term cocaine signifies both the drugs cocaine and crack.

Cases in which the arrestee's self-report matches with his urinalysis are coded as 0. Cases in which the arrestee does not self-report drug use but the urinalysis is positive will be coded as 1. Cases in which the respondent self-reports drug use but his urinalysis is not positive will be coded as 2.

The dependent variable for the drug cocaine was created by cross-checking the urinalysis test with the respondent's self-reported cocaine use within the last 72 hour period. Cases in which the arrestee's self-report matches with his urinalysis are coded as 0. Cases in which the arrestee's self-reported drug use does not match the urinalysis will be coded as 1. The coding of the variable "Coc_no_match" differs from "Mj_no_match" because only 27 (1.1%) of the cases were found where the respondent self-reported drug use but his urinalysis was not positive. Thus, those cases that the arrestee did not self-report cocaine use but the urinalysis is positive and the cases in which the respondent self-reports cocaine use but his urinalysis was not positive were combined and coded as 1 for the dependent variable affiliated with the drug cocaine. This particular problem was not relevant when dealing with the drug marijuana because there were enough cases (N=171) available to warrant a discussion of false positive reporting.

In all, eleven independent variables will be analyzed,

including respondent characteristics (age, ethnicity, education, marital status, employment, and income), interviewer characteristics (gender and ethnicity), and situational factors (severity of charge (misdemeanor/felony), drug choice, and perceived need for substance abuse treatment). These variables and their frequencies are displayed in Table 1, which illustrates the original coding, and Table 2 which shows the recoding for the current analysis.

After all cases with missing data were eliminated from the sample a total sample size of 1093 cases was left, as shown in Table 3. The sample contains 543 (49.7%) arrestees who are non-white and 550 (50.3%) who are white. Six hundred and four (55.3%) of the arrestees were single and 489 (44.7%) were married. With respect to employment, 555 (50.8%) arrestees were employed full-time, 281 (25.7%) were employed part-time, and 257 (23.5%) were unemployed. The number of arrestees whose incomes were below the poverty line were 466 (42.6%), while 627 (57.4%) of the arrestees had incomes above the poverty line. The average arrestee in this sample was between 26 and 30 years old. Seven hundred and seventy one (70.5%) finished high school or completed the GED, but only 253 (23.1%) had any college experience.

The rationale for selection of these variables is provided below, followed by the hypotheses which pertain to both marijuana and cocaine.

Respondent Characteristics

As discussed by Weis (1986), respondent characteristics play an important role in the reliability of self-reported data. The respondent characteristics that will be analyzed here will include ethnicity, marital status, employment, income, age, and education.

Ethnicity

As discussed above, there has been a great deal of interest concerning the influence of ethnicity on the reliability of self-reported data. To a large extent, the literature consistently suggests that ethnicity is significantly associated with the accuracy of self-reports concerning drug use (Falck et al., 1992; Wish and Gropper, 1990; Hindelang et al., 1981; Chaiken and Chaiken, 1982; Chaiken, Chaiken and Peterson, 1982; Hirschi, 1969). One of the first to examine this was Hirschi (1969) when he found that Black high school students were less likely to admit in a self-report that they had been picked up by the police than were white high school students. Similarly, Hindelang et al. (1981) reported that Black male delinquents were less likely to report offenses known to police in self-reports than were white delinquents. Chaiken and Chaiken's (1982) criminal career research also supported the above research finding that Blacks have less accurate self-reported criminal activity.

While prior research has demonstrated that ethnicity does affect self-reported information concerning official records, there has been little examination focusing on the effect of ethnicity on self-reported drug use. One of the few studies to date concerning characteristics influencing the accuracy of self-reported drug use was that of Falck et al. (1992) which found that Blacks were significantly more likely than whites to falsify their self-report according to their urinalysis. Based on these findings, the following hypothesis is postulated:

Hypothesis I:

> When comparing self-reported drug use with urinalysis, those arrestees who are non-white will be significantly more likely to have a self-report which does not match their urinalysis than arrestees who are white.

Marital Status

While past literature has not shown that marital status is a significant factor associated with inaccurate self-reports, control theory suggests that an individual's personal and social bonds (e.g. marriage) may influence the person's behavior. In short, the weaker the person's social bond, the more likely it is the person will violate a social norm

(Hirschi, 1969). While I do not have a direct measure of the social bond that the respondent has to society, the respondent's marital status is an indirect indicator of such a social bond. One problem with testing control theory when examining the accuracy of self-reported drug use is that the arrestee may have already used drugs, which is a much more serious violation of a social norm than would be lying to the interviewer about whether he has actually used drugs. With this in mind, the following hypothesis will be tested regarding social control theory:

Hypothesis II:

> When comparing self-reported drug use with urinalysis, those arrestees who are single will be significantly more likely to have a self-report which does not match their urinalysis than arrestees who are married.

Employment and Income

The variables measuring employment and income will be examined to establish a direct measure of the arrestees' socio-economic status. Prior research suggests that there is little direct evidence that socio-economic status plays a significant role in the reliability of self-reported data. For instance, Reis and Rhodes (1961), Hirschi (1969), Williams

and Gold (1972), Wolfgang et al. (1972), and Elliott and Voss (1974) have all found that the reliability of self-reported criminal activity does not vary by the respondent's socio-economic status. However, there is evidence to the contrary that suggests that lower class respondents are more likely to under-report serious crimes (Elliott and Ageton, 1980; Elliott and Huizinga, 1983). In addition, because many researchers in the past have had to compensate for not having a direct measure of the respondent's economic status by using some indirect measure, such as Nye and Short's (1957) use of parent's income for economic status, data from DUF may enable a more precise measurement of the respondent's socio-economic status through a direct measurement of the individual's income. Furthermore, little research has addressed the association between the respondent's socio-economic status and the respondent accurately self-reporting drug use, which makes DUF one of the few research vehicles available to examine this question. Thus, the following hypotheses will be tested:

Hypothesis III

> When comparing self-reported drug use with urinalysis, those arrestees who are not employed full-time will be significantly more likely to have a self-report which does not match their urinalysis than arrestees who are employed full-time.

Hypothesis IV:

> When comparing self-reported drug use with urinalysis, those arrestees whose incomes are below the poverty line of $531.50 per month (U.S. Department of the Census, 1991) will be significantly more likely to have a self-report which does not match their urinalysis than arrestees whose incomes are above the poverty line.

Age

While research has suggested that juvenile delinquents are less reliable than non-delinquents, and chronic adult offenders are less reliable than adults in general (Weis, 1986), there has been only a minimal amount of research concerning the effect of age on the reliability and validity of self-reported drug use (Falck et al., 1992; Hser, Anglin, and Chou, 1992; Mensch and Kandel, 1988). The findings from these studies have varied considerably. For instance, Mensch and Kandel (1988) found in their study of the under-reporting of substance abuse in the National Youth Study that 19 to 21 year old males were significantly more likely to have inconsistent self-reports from one year to the next compared to 22 to 24 year olds and 25 to 27 year olds. However, Falck et al's. (1992) study of injection users found a strong trend in those 30-39 to falsify their drug use status, when

comparing self-reports to urinalyses. Contrary to these studies, Hser et al. (1992) found that age did not have a significant effect on the reliability of self-reported drug use among narcotic users. Consequently, there has been no consensus in how age may affect the reliability of self-reported drug use.

Because Hser et al. (1992) and Falck et al.'s (1992) studies primarily examined older respondents and Mensch and Kandel's (1988) examination primarily focused on the issue of age and its effect on the reliability of self-reporting drug use, the following hypothesis is proposed:

Hypothesis V:

> When comparing self-reported drug use with urinalysis, those arrestees who are relatively young will be significantly more likely to have a self-report which does not match their urinalysis than arrestees who are relatively old.

Education

School performance and/or intellectual ability has also been shown to have an effect on the respondent's ability to perform such tasks as recognizing and reporting delinquent behavior in a self-report (Hindelang et al., 1981). Research concerning the effect of education on the reliability and

validity of self-reports has been most extensively studied in career criminal research. This research suggests that those less educated are more apt to misrepresent themselves in self-reports (Weis, 1986; Chaiken and Chaiken, 1982; Chaiken, Chaiken, and Peterson, 1982). These findings have also been found in drug research (Mensch and Kandel, 1988). Mensch and Kandel (1988) found that education had a significant effect on the reliability of self-reported drug use when focusing on 19 to 27 year olds. They found that those without a diploma were twice as likely as respondents with a diploma or GED to be inconsistent in their interviews year to year. In addition, high school graduates were almost twice as likely as those with some college experience to be inconsistent in their interviews. On the other hand, when Falck et al. (1992) specifically examined the effect of education on the reliability of self-reported drug use they found that education was not directly related to falsifying self-reported drug use. Based on the above career criminal and drug research the following hypothesis will be tested:

Hypothesis VI:

> When comparing self-reported drug use with urinalysis, those arrestees who have a lower education will be significantly more likely to have a self-report which does not match their urinalysis

than those arrestees who have a higher education. Specifically, the term lower education is operationalized as no high school degree/GED and/or no college experience. The term higher education is operationalized as those arrestees who have a high school degree/GED and/or some college experience.

Interviewer Characteristics

Weis (1986) states that interviewer characteristics play an important role in the reliability of self-reported data. The interviewer characteristics which are available for analysis here are the gender and ethnicity of the interviewer.

Gender and Ethnicity of the Interviewer

The effect of the interviewer's gender and ethnicity was thoroughly reviewed by Esbensen and Menard (1991). In their review of the literature concerning the gender of the interviewer they stated "the effect of interviewer sex has been widely studied, with consistent results. Respondents generally provide more socially desirable responses to female interviewers than they do to male interviewers" (1991:151).

Moreover, in Esbensen and Menard's (1991) review, they stated that the race of the interviewer has been found to be significantly correlated with the accuracy of the self-

reported data. It appears that when an interviewer and the respondent are of different races the responses are less accurate than when the interviewer and the respondent are of the same race (Esbensen and Menard, 1991).

However, in the same study Esbensen and Menard (1991) performed their own analysis of interviewer effects upon 1,494 youths in the National Youth Survey (NYS), and they found that the sex, race, age, and social class of the interviewer were not significantly related to the accuracy of self-reported data. In another study concerning the effects of interviewer race and gender, Esbensen (1983) found that when the interviewer and respondent were of different races the respondent would produce higher delinquency rates, especially amongst those who had committed felony assault and theft. In addition, female interviewers obtained more socially acceptable answers than did males (Esbensen, 1983).

Contrary to Esbensen and Menard (1991), Mensch and Kandel (1988) take somewhat of a different approach. They were concerned that perhaps the demographic traits of the interviewer would affect the outcome of the self-report only if the questionnaire in some way dealt with the trait in question; thus a racial effect may occur if the question pertains to race. In regards to this, in their study of 2,872 19 to 27 year olds they found that neither the race nor gender of the interviewer affected the reliability of reporting drug

use (Mensch and Kandel, 1988). Thus the following hypotheses will be tested:

Hypothesis VII:

When comparing self-reported drug use with urinalysis, those arrestees who are interviewed by a male will be significantly more likely to have a self-report which does not match their urinalysis than those arrestees who are interviewed by a female.

Hypothesis VIII:

When comparing self-reported drug use with urinalysis, those arrestees who are interviewed by a white interviewer will be significantly more likely to have a self-report which does not match their urinalysis than those arrestees who are interviewed by a non-white interviewer.

Situational Factors

Situational factors have also been found to play an important role in the reliability of self-reported data (Falck et al., 1992; Weis, 1986; Chaiken and Chaiken, 1982; Marshall and Webb, 1993). Severity of charge (misdemeanor v. felony), drug choice, and perceived need for substance abuse treatment

will be analyzed here.

Severity of Charge

As discussed above, those who engage in serious property and/or violent crime have been found to give more unreliable self-reports (Weis, 1986; Chaiken and Chaiken, 1982; Chaiken, Chaiken, and Peterson, 1982; Marquis and Ebener, 1981). For instance, Gold (1966) found that offenders would over-report minor offenses and under-report serious offenses so that the offender would present the best picture of his/her self. In addition, Chaiken and Chaiken (1982) found that those who are violent offenders or those who perceive themselves as thieves were more likely to have self-reports which disagree with their official records. This led Weis (1986) to conclude that adult prisoners and life-style criminals have been found to give less accurate self-reported criminal behavior than those in the general population. Contrary to these findings is Petersilia et al.'s (1978) research which found that the less serious offenses were the most likely to be under-reported.

While the majority of the research in this area has taken place in the criminal career field, there has been some examination with arrestees and drugs. One such study was Hser et al. (1992) in which they found that extensive criminal activities, as depicted in official records, did have a significant effect on the reliability of self-reported drug

use among narcotic users. Accordingly, those who are arrested for felonies may be more likely to misrepresent themselves in the DUF self-report. Thus, the following hypothesis will be tested:

Hypothesis IX:

> When comparing self-reported drug use with urinalysis, those arrestees who are arrested for a felony will be significantly more likely to have a self-report which does not match their urinalysis than those arrestees who are arrested for a misdemeanor.

Drug Choice

Drug of choice has been associated with "untruthful" self-reported drug use in past research. For example, Falck et al. (1992) found that those whose primary drug choice was crack, or who injected cocaine, were significantly more likely to misrepresent themselves in a self-report when compared to their urinalysis. However, their analysis with this variable was problematic because their sample was limited to those who had already acknowledged being injection drug users. Albeit, Wish and Gropper (1990) confirmed Falck et al.'s (1992) conclusions, finding that when comparing self-reported drug use to urinalysis, arrestees were more likely to admit to

marijuana use than to cocaine use. This was also found by Hser et al. (1992) in that those who used narcotics and alcohol heavily compared to other respondents were more likely to have self-reports and urinalyses that did not match. Conversely, Mensch and Kandel (1988) found that those who are experimental marijuana users are less reliable in self-reporting drug use than those who use marijuana regularly. Based on the above evidence the following hypothesis will be tested:

Hypothesis X:

> When comparing self-reported drug use with urinalysis, those arrestees who have injected drugs will be significantly more likely to have a self-report which does not match their urinalysis than those arrestees who have not injected drugs.

Perceived Need for Treatment

Only a minimal amount of research has been done concerning perceived need for treatment and its association with those who may misrepresent themselves in self-reports. The most specific study concerning this subject is Marshall and Webb's (1993) examination of factors that are related to the perceived need for substance abuse treatment among 2,400 male DUF arrestees. When they compared the respondents whose

self-reported drug use did not match their urinalysis to those respondents whose self-reported drug use matched their urinalysis, the former were more likely to express the need for substance abuse treatment.

While the same sample is being used in this paper, similar results may not be found because Marshall and Webb (1993) constructed their "arrestee truthfulness" variable quite differently than the dependent variable constructed here. First, Marshall and Webb (1993) only examined those cases in which the arrestee's urinalysis was positive. Next, each drug that was found to be positive within the urine was counted. In other words, if the respondent tested positive only for marijuana he would have a count of one. Marshall and Webb (1993) then counted the number of drugs the arrestee self-reported in the past 72 hours. If the arrestee's self-reported counts were less then the arrestee's urinalysis counts then the arrestee was considered an "untruthful" respondent. Based on these findings, the following hypothesis will be tested:

Hypothesis XI:

> When comparing self-reported drug use with urinalysis, those arrestees who perceive a need for drug treatment will be significantly more likely to have a self-report which does not match their

urinalysis than those arrestees who do self-report a perceived need for drug treatment.

ANALYSIS AND FINDINGS

The objective of the current analysis is to examine the variables associated with when the respondents' self-report does not match their urine sample. Descriptive statistics are used to analyze these data, and bivariate analysis is employed using chi square. These findings provide initial evidence on the relationship between the independent variables and the likelihood that an arrestee's self-report will not match his urinalysis.

This section presents the results of the bivariate analyses of the three sets of independent variables (respondent characteristics, interviewer characteristics, and situational factors) with the two dependent variables. A frequency distribution for each variable was completed. Table 4 presents the frequencies for the drug marijuana and Table 5 presents the frequencies for the drug cocaine. Tables 4 and 5 also illustrate the chi-square analyses that were conducted.

Marijuana

Table 3 shows that 8.6% of the arrestees self-reported that they had not used marijuana in the past 72 hours, although they tested positive for marijuana. Furthermore,

8.0% of the arrestees self-reported having used marijuana in the past 72 hours, but tested negative for marijuana.

When comparing self-reported marijuana use with the arrestee's urine test no significant differences were found relating to ethnicity (P=.961), marital status (P=.104), income (P=.998), age (P=.082), interviewer sex (P=.341), interviewer race (P=.582), or seriousness of charge (P=.594) (See Table 4). However, three variables were found to significantly influence the accuracy of self-reported marijuana use when compared to urinalysis. These were: 'college', 'ever inject', and 'perceived need for drug treatment'.

First, the variable 'college' was found to be significant at the .05 level of confidence. The arrestees who self-reported marijuana use, but whose urine was negative, were over twice as likely to not have any college experience (9.0% did not have any college experience, while only 4.3% had some college experience). However, the above findings concerning education are inconsistent when compared to findings based on the variable 'high school diploma/GED'. The arrestees who self-reported marijuana use but whose urinalysis was negative, were just as likely not to have a high school diploma/GED as to have a high school diploma/GED (9.6% did not have a high school diploma/GED, while 7.3% did have a high school diploma/GED).

Thus, hypothesis VI, which stated that the lower the education the arrestee has the more likely they will have a self-report which does not match their urinalysis, was only moderately supported. While it was found when exclusively examining the variable 'college' that the less education the arrestee had the more likely he was to have a self-report which did not match his urinalysis, when examining the variable 'high school degree/GED' the amount of education did not significantly affect whether or not the arrestee's self-report would match his urinalysis.

An examination of Table 4 indicates that Hypothesis X was also supported when cross-checking the urinalysis test with the respondent's self-reported marijuana use within the last 72 hour period. Hypothesis X states that when comparing self-reported drug use with urinalysis, those arrestees who have injected drugs will be significantly more likely to have a self-report which does not match their urinalysis than arrestees who have not injected drugs. Chi-square analysis indicated that there was a significant difference at the .05 level of confidence when comparing the dependent variable 'Mj_no_match' with the independent variable 'ever inject'. More specifically, of the arrestees who did not self-report marijuana use but whose urinalysis was positive, 9.2% reported injecting drugs, while 6.6% stated that they had not injected drugs before. For the arrestees who self-reported marijuana

use but whose urine was negative, only 6.7% reported injecting drugs, while 12.3% stated they had not injected drugs before. In other words, it was found that arrestees who self-reported marijuana use but whose urine was negative were approximately twice as likely to self-report injecting drugs before.

A significant difference was also found when examining the independent variable 'perceived need for drug treatment' (P=.000). Among the arrestees who did not self-report marijuana use but whose urinalysis was positive, 9.7% did not perceive a need for drug treatment, while only 2.0% stated that they did need drug treatment. Conversely, when examining the arrestees who self-reported marijuana use but whose urine was negative, 6.2% did not perceive a need for drug treatment, compared to 19.0% who perceived a need for drug treatment. Thus, hypothesis XI, which stated that when comparing self-reported drug use with urinalysis, those arrestees who perceive a need for drug treatment will be significantly more likely to have a self-report which does not match their urinalysis than arrestees who do not self-report a perceived need for drug treatment was supported.

Interestingly, upon further analysis, when the dependent variable for marijuana is constructed dichotomously, the same way the dependent variable for cocaine is constructed (0 equals SR and urine match; 1 equals the SR and the urinalysis do not match) the independent variables 'marital status',

'age', and 'college' are found to be significant at the .05 level of confidence as seen in Table 6. More specifically, those whose self-reported marijuana use did not match their urinalysis were more likely to be single, between the age of 21 to 25, and were not likely to have any college experience.

At first glance it may seem appropriate to operationalize the dependent variable dichotomously, but as discussed earlier it does not take into effect the directionality of the self-report when compared to the urinalysis. In other words, if the dependent variable is constructed dichotomously it would not allow for the discussion of false negative drug tests, those who self-reported the use of marijuana but whose urinalysis tested negative, which made up a substantial number of the sample (8.0%). It would also combine those who self-reported that they had not used marijuana in the past 72 hours but whose urine tested positive with those who self-reported that they had used marijuana in the past 72 hours but whose urinalysis tested negative, when in fact the two groups are qualitatively different from one another.

Cocaine

As shown in Table 3, 11.7% of the arrestees had self-reports which did not match their urinalyses. When examining the arrestee's self-reported cocaine use with his urinalysis, no significant differences were found between arrestees

associated with marital status (P=.098), employment (P=.099), income (P=.913), age (P=.446), high school degree/GED (P=.883), college (P=.139), interviewer sex (P=.692), interviewer race (P=.375), or ever inject (P=.422). The variables 'race', 'most serious charge', and 'perceived need for drug treatment' were found to significantly influence the accuracy of self-reported cocaine use (See Table 5).

As stated above, chi-square analysis indicated that there was a significant difference at the .000 level of confidence when comparing the race of the arrestee to the dependent variable "Coc_no_match." Among the arrestees whose self-reported cocaine use did not match their urinalysis, 17.1% were non-white, while only 6.4% were white. Thus hypothesis I, which stated that when comparing self-reported drug use with urinalysis, those arrestees who are non-white will be significantly more likely to have a self-report which does not match their urinalysis than arrestees who are white, was supported for the drug cocaine.

The ninth hypothesis, which stated that when comparing self-reported drug use with urinalysis, those arrestees who are arrested for a felony will be significantly more likely to have a self-report which does not match their urinalysis than arrestees who are arrested for a misdemeanor, was also statistically supported when examining the drug cocaine (P=.000). More specifically, of the arrestees whose self-

reported cocaine use did not match their urinalysis, 9.1% were arrested for misdemeanors, while 17.1% were arrested for felonies. In other words, when asked about the drug cocaine, those arrestees who were arrested for felonies were approximately twice as likely to have a self-report which did not match their urinalysis than those arrestees who were arrested for a misdemeanor.

Lastly, a significant difference was also found when examining the independent variable 'perceived need for drug treatment' (P=.000). For those arrestees whose self-reported cocaine use did not match their urinalysis, only 9.4% stated that they did not perceive themselves as needing drug treatment, compared to 26.1% of those arrestees who stated that they perceived themselves as needing drug treatment. Thus, hypothesis XI for cocaine, which stated that when comparing self-reported drug use with urinalysis, those arrestees who perceive a need for drug treatment will be significantly more likely to have a self-report which does not match their urinalysis than arrestees who do not self-report a perceived need for drug treatment, was supported.

Summary

In sum, the findings above present the results of the bivariate analyses of the three sets of independent variables (respondent characteristics, interviewer characteristics, and

situational factors) with the two dependent variables. The purpose of this investigation was to predict those DUF arrestees who were most likely to misrepresent themselves on self-reporting drug use when compared to urinalysis.

In general, little variation existed among many of the variables. This suggests that these variables themselves may not be associated with those cases in which the arrestee's self-reported drug use does not match his urinalysis. Three of the variables (college, ever inject, and perceived need for drug treatment) were found to have statistically significant relationships with arrestees' whose self-reported marijuana use did not match their urinalysis. When constructing the dependent variable for marijuana similarly to how the dependent variable cocaine was constructed, the independent variables marital status, age, and college were found to be significant. When cross-checking the urinalysis test with the respondents' self-reported cocaine use three independent variables were found to have statistically significant relationships: race, most serious charge, and perceived need for drug treatment.

DISCUSSION

The objective of the present study was to test eleven hypotheses that may aid in developing a detailed description of the variables that are associated with arrestees whose

self-reports do not match their urinalyses. Nearly 9% of the arrestees who claimed that they had not used marijuana in the past 72 hours had a positive urinalysis for marijuana. Additionally, 8% of the arrestees claimed to have used marijuana in the past 72 hours but their urinalysis did not test positive for the drug marijuana. For the drug cocaine, only 11.7% of the arrestees had self-reports which did not match their urinalyses. However, in many prior studies that used urinalyses to confirm self-reports, discrepancy rates ran much higher: Amsel et al., 1976, 14%; Bale et al., 1981, 17%; Dembo et al. 1990, 30%; and Falck et al. 1992, 30%. All of these studies examined only heroin and cocaine with the exception of Dembo et al. (1990), which briefly examined issues surrounding marijuana.

When examining the drug marijuana during the course of this study a potentially serious problem concerning the compatibility of the DUF self-report instrument and the EMIT drug test was discovered. Past literature concerning the length of time the drug marijuana can be detected in urine is fairly consistent; with those who occasionally use marijuana (once or twice a week), marijuana is generally detectable for up to three days, for those who smoke a moderate amount of marijuana (four times a week), marijuana is detectible up to four days, for those who use daily the drug marijuana is detectable up to 10 days, and among those who are chronic

marijuana users (daily for months), it can be detected up to 27 days (Hawks and Chiang, 1986; Visher, 1991; and Bureau of Justice Statistics, 1992b). Thus, "a positive urinalysis for marijuana simply means that the arrestee used marijuana within the recent past which could be hours, days, or weeks ... and without further knowledge about the arrestee's drug use habits a more specific explanation is not possible" (Hawks and Chiang, 1986: 87). Furthermore, the DUF instrument is constructed in such a way that it only asks the arrestee "In the last 3 days did you use [marijuana]?" and the "# of days used in last month?"

Thus, since EMIT can detect daily marijuana users up to 27 days after use, it is possible that many of the urinalyses may have tested positive for marijuana when in fact the arrestee did not actually use marijuana within the last 72 hours. In other words, since the dependent variable for marijuana was constructed by cross-checking the urinalysis test with the respondent's self-reported marijuana use within the last 72 hours, this variable may have mislabeled some arrestees as those being more likely to falsely report marijuana use.

Upon further analysis this argument does not seem likely. Assuming, that the EMIT test may be flawed for those arrestees who are moderate users (those who use marijuana 4 or more times a week), arrestees would still test positive for the

drug marijuana even though they had not really used the drug in the past 72 hours. By constructing a magnitude of marijuana use scale based on the question "# of days in the last month have you used [marijuana]?" we would be able to show that the moderate users, those who self-reported marijuana use 16 or more times in the last month, may have had a positive urine test because of the residual marijuana that was still left in the arrestee's body fat. This was found not to be the case. In only 1 (1.1%) of the 94 cases where the arrestee did not self-report marijuana use but whose urinalysis was positive did the arrestee self-report that he had used marijuana more than 15 times in the past month. This was further supported by Visher (1991) when she found that false positives only occur 2.1% of the time with the drug marijuana, thus strengthening the belief that EMIT is not likely to generate many false-positives.

In addition to the problems associated with the cases in which the arrestee does not self-report marijuana use but the urinalysis is positive, the findings concerning the arrestees who claimed to have used marijuana, but their urinalysis proved negative, again raises some speculation as to the accuracy of the EMIT test used in the DUF program.

While the findings associated with the arrestees who claimed to have used marijuana, but whose urinalysis was negative, may be due to the arrestee intentionally lying to

the interviewer, the more likely explanation is that it was not the arrestees who were lying but rather it was the urinalyses tests that were in fact wrong. This has been demonstrated in past research. The most thorough study was Visher's (1991) examination of urinalysis testing technologies. She used 2,400 adult parolees in California and 198 arrestees in San Diego, California to compare the screening drug test EMIT to the confirmation drug test GC/MS which "is considered the absolute standard for identifying drugs" (Wish and Gropper, 1990:343).

Visher (1991) found a false negative rate of 29.0% when using the EMIT test to identify the drug marijuana, meaning the EMIT test falsely identified a urine specimen as negative when in fact the urine specimen should have been identified as positive. This was further discussed by Reardon who stated that EMIT produces "...almost no false positives and about 20% false negatives" (1993:6). Thus the 8.0% of arrestees who self-reported marijuana use but tested negative in our sample may have been telling the truth. (The problems presented above with the drug marijuana are not associated with the drug cocaine) (BJA, 1992a; Visher, 1991).

Upon further analysis, after eliminating the cases in which the respondent self-reported marijuana use but the urinalysis was negative, the only variable that was still statistically significant was the question related to those

who perceived a need for drug treatment. The findings indicated that those who did not self-report marijuana use but whose urinalysis was positive were approximately 5 times as likely as to say that they did not perceive a need for drug treatment. This finding is peculiar because it is contrary to that found with the drug cocaine, in which those who did perceive a need for drug treatment were 3 times as likely to have self-reports and urinalyses which did not match.

For the drug cocaine the present findings are indicative of past research. When examining respondent characteristics past literature has overwhelmingly suggested, in both the criminal career research and drug research, that non-whites are more likely to give inaccurate self-reports (Falck et al., 1992; Wish and Gropper, 1990; Hindelang et al., 1981; Chaiken and Chaiken, 1982; Chaiken, Chaiken and Peterson, 1982; Hirschi, 1969). This may be because minorities may feel more threatened by self-reports which inquire about deviant activities. For example, findings from Monitoring the Future found that 14% of the Black non-drug users would not admit to using marijuana even if they had used marijuana, compared to 6% of whites who had never used drugs (Johnston et al. 1984). Hindelang et al. (1981) also concluded that Blacks under-report their criminal offenses more than whites, and since then these findings have been confirmed by Chaiken et al. (1982) and Chaiken and Chaiken (1982).

But why would minorities feel more threatened by self-reporting drug use than whites? One possibility may be that non-whites simply do not trust the research process that takes place, particularly a research project such as the Drug Use Forecasting (DUF) program. Also, particularly in Omaha, Nebraska non-whites may feel more threatened then would whites because, "... historically, virtually all of the people associated with ... the Omaha police force have been white, which has in turn created ...[an] image that [it is a] 'white' organization, ... [in which its] members are expected to think and act in white ways" (Hacker, 1992:23). Thus, it could then be argued that black respondents respond much differently than white respondents to questions regarding drug use in the DUF study in Omaha "since they see themselves as being judged by more coercive criteria, which call on them to deny large parts of themselves" (Hacker, 1992:23). This argument may have some merit, particularly in a research setting such as the Drug Use Forecasting (DUF) program where it takes place within an interrogation room in which the arrestee may have been interrogated just hours before the DUF interview.

Another possibility why Blacks respond differently than whites on self-reports may be that the cultural values of Black males have evolved into a learned response of non-cooperation with authority figures (including Black researchers). Consequently, Blacks have learned to respond to

questions regarding their culpability with responses that will safeguard their well being (Weis, 1986). Because of the above Weis (1986) postulates that Blacks feel that authority figures are to be "hustled and cajoled into believing in the sincerity and veracity of the respondent" (p. 30).

It has also been argued that Blacks may give less valid and reliable self-reports than whites because of the large differences in intelligence/education levels of the two groups (Weis, 1986). In Hindelang et al.'s, (1981) study of Seattle youth they reported that the differences between Blacks and whites with regard to self-reported delinquency were partially attributed to difference in knowledge of the two groups, with the less knowledgeable respondent being the more likely to under-report their delinquent activities. Thus Black males were more likely to under-report delinquency.

Concerning the seriousness of the charge, the data suggested that those whose self-reported cocaine use did not match their urinalysis were more likely to be arrested for felonies. This finding is consistent with past literature in that the seriousness of the charge (misdemeanor v. felony) among arrestees has been found to produce inaccurate self-reports (Chaiken an Chaiken, 1982). Weis (1986) further stated that lifestyle criminals are more likely to give less accurate self-reports, although he contends that this may be due to the fact that many chronic offenders are often under

the influence of drugs and thus are unable to remember details that are important to self-reports. Hser et al. (1992) also found that those with extensive criminal records were more likely to misrepresent themselves in their self-report.

Findings from the bivariate analyses also appear to indicate that those who perceived a need for drug treatment were nearly three times as likely to have their self-reported cocaine use not match their urinalysis. This finding is supported by Marshall and Webb's (1993) bivariate analysis. They found that "untruthful respondents" were more likely to express a need for treatment. This seems to be contrary to logic because the arrestee has self-confessed a need for drug treatment, but at the same time he has denied using cocaine in the past 72 hours. An explanation may be that when the arrestee is asked if he has used cocaine in the past 72 hours, he denies the drug use because of the badness associated with drug use that is portrayed in the law, society, and the church. On the other hand, the arrestee may be willing to admit that he needs drug treatment because drug treatment has historically been viewed as a disease or a problem that can be handled medically, thus this admission is more socially acceptable.

Lastly, the data indicated that interviewer related characteristics, such as sex and race, were not significant predictors of inaccurate DUF self-reports for either the drug

marijuana or cocaine.

In summary, the results of the present study indicate that the accuracy of self-reported drug use varies considerably from one drug to another. In the case of a soft drug such as marijuana, the error rate may not be necessarily associated with a particular characteristic of the arrestee. However, when examining a relatively hard drug, such as cocaine, self-reports may be more influenced by respondent characteristics and situational factors.

CONCLUSIONS AND RECOMMENDATIONS

This paper supports the conclusions of prior research showing that those who are non-white, felons or who perceive a need for drug treatment are more apt to misrepresent themselves in the self-reporting of a relatively hard drugs such as cocaine. However, analyses show that for a relatively soft drug, such as marijuana, when the self-report and the urinalysis do not match it is not necessarily due to the untruthfulness of the respondent, but rather may be due to error in the detection device or may be due to the fact that the DUF self-report and the EMIT drug test are not compatible when examining the drug marijuana. Although this analysis is not conclusive, it supports the conclusions reached by a number of other researchers.

Based on the findings above, researchers in the future

need to address the problem of the incompatibility of the DUF self-report and the EMIT drug test. One solution may be to simply add more descriptive questions concerning the frequency of drug use. For example a question could be added to the DUF questionnaire which asks the arrestee, "Are you an occasional user, meaning one time user, moderate user, meaning uses up to four times a week, heavy user, meaning uses every day, or a chronic user, meaning has used the drug in question every day for months?" This would enable a much more accurate description of the arrestee's drug behavior compared to the current question which asks the "# of days used in the last month?" In addition, this would allow researchers to assess the reliability of the arrestees' drug use much more accurately.

Secondly, future analyses should clarify questions regarding multi-variate relationships that may exist between variables. An experiment could be implemented that includes criminals and non-criminals, educated and uneducated, white and non-white, male and female, young and old, and violent and non-violent which would allow for the study of interaction between variables. Failure to take into account inter-correlations between some of these factors might lead towards false conclusions that may place too much emphasis on a single variable.

Thirdly, future studies should concentrate on populations

other than arrestees. This would give a more factual picture of those who misrepresent themselves on self-reports concerning drug use, because arrestees are not representative of the general population.

Fourth, further research should continue to address the characteristics that are associated with self-reports which do not match urinalyses in order to establish an appropriate baseline of drug use. If further research produces the same results, we would be better able to develop appropriate models to determine the number of drug users in this population.

Fifth, because national surveys rely only on the truthfulness of the respondents, findings from these surveys may be able to incorporate DUF findings in order to provide a more accurate picture of the drug using community. For example, the estimates derived from DUF may be valuable in estimating the amount of misreporting that takes place in both the National Household Survey and the National High School Survey by creating a statistical model based on DUF variables which have been found to affect self-reported drug use.

More precisely concerning these findings, it may be necessary to inflate self-reported cocaine estimates for non-white felons among arrestees by the margin of error found between the self-report and the urinalysis to aid in a more accurate description of cocaine use within the arrestee population.

Furthermore, it is essential that future research examine the measurement issues surrounding the drug marijuana. As shown in this study, how the drug marijuana was operationalized determined to a great extent the characteristics that were associated with those who misrepresented themselves on the self-report. I would suggest that those individuals who state that they had self-reported marijuana but their urinalysis was positive be examined quantitatively differently, by paying closer attention to the mechanics of urinalysis technology, than those who self-report that they had not used marijuana but their urine test is positive because of the different influencing technological factors as discussed earlier.

Lastly, the data presented here for both the drug marijuana and cocaine suggest that the variable 'perceived need for treatment' is an influencing situational factor for those arrestees whose self-report and urinalysis do not match. Further research should explore possible explanations for this influencing characteristic that may in the future assist in the evaluation and assessment of individuals within drug treatment programs.

REFERENCES

Amsel, Z., Mandell, W., Matthias, L., Mason, C., and Hocherman, I.
1976 Reliability and validity of self-reported illegal activities and drug use collected from narcotics addicts. The International Journal of the Addictions, 1(2): 325-336.

Babbie, E.
1992 The Practice of Social Research. Belmont: Wadsworth Publishing.

Bachman, J.G. and O'Malley, P.M.
1981 When four months equal a year: Inconsistencies in Students' reports of drug use. Public Opinion Quarterly, 45: 536-548.

Bachman, J.G. Johnson, L.D., and O'Malley, P.M.
1980 Monitoring the Future: Questionnaire Responses from the Nation's High School Seniors. Ann Arbor: University of Michigan.

Bale, R.N., W.W. Van Stone, T.M. Engelsing and V.P. Zarcone
1981 The validity of self-reported heroin use. International Journal of the Addictions, 16(8): 1387-1398.

Ball, J.C.
1967 The reliability and validity of interview data obtained from 59 narcotic drug addicts. American Journal of Sociology, 72(6): 650-654.

Barnea, Z., Rehav, G., and Teichman, M.
1987 The reliability and consistency of self-reports on substance use in a longitudinal study. British Journal of Addiction, 82: 891-898.

Becker, H.S.
1963 Outsiders. New York: Free Press.

Blanke, R.V.
1986 Accuracy in urinalysis. In Urine Testing for Drugs of Abuse, edited by R.L. Hawks and C.N. Chiang. National Institute on Drug Abuse Research Monograph no. 73. Rockville, Md.: U.S. Department of Health and Human Services, National Institute on Drug Abuse.

Bureau of Justice Statistics.
1992a Drugs and Crime Facts. Washington, D.C.: GPO.

1992b Drugs, Crime, and the Justice System. Washington, D.C.:GPO.

Chaiken, J.M. and Chaiken, M.R.
1982 Varieties of Criminal Behavior. Santa Monica: Rand Corporation.

Chaiken, J.M., Chaiken, M.R., and Peterson, J.E.
1982 Varieties of Criminal Behavior: Summary and Policy Implications. Santa Monica: Rand Corporation.

Chaiken, J.M., Chaiken, M.R., and Rolph J.E.
1983 Self-reported commissions of crimes: Comparison of two questionnaire formats. Santa Monica: Rand Corporation.

Clark, J.P. and Tifft, L.L.
1966 Polygraph and interview validation of self-reported deviant behavior. American Sociological Review, 31: 615-623.

Darke, S., Heather, N., Hall, W., Ward, J., and Wodak, A.
1991 Estimating drug consumption in opiod users: Reliability and validity of a "recent use" episodes method. British Journal of Addiction, 86(10): 1311-1316.

DEA Fact Sheet.
1988 Washington D.C.: Government Printing Office.

Decker, S.H.
1992 Assessing the Need for Drug Treatment Among Arrestees: Developing a Model for Policy. Washington, D.C.: NIJ.

Dembo, R., Williams, L., Wish, E.D., and Schmeidler, J.
1990 Urine Testing of Detaining Juveniles to identify High-Risk Youth. Washington, D.C.: NIJ.

Eckerman, W.C., Bates, J.D., Rachal, J.V., and Poole, W.K.
1971 Drug Usage and arrest charges. Washington, D.C.: Drug Enforcement Administration.

Elliott, D.S. and Voss, H.L.
1974 Delinquency and Dropout. Lexington, MS: D.C. Health.

Elliott, D.S. and Ageton, S.
1980 Reconciling race and class differences in self-reported and official estimates of delinquency. American Sociological Review, 1:95-110.

Elliott, D.S. and Huizinga, D.
1983 Social class and delinquent behavior in a national youth study. Criminology, 21, 149-177.

Esbensen, F. and Menard, S.
1991 Interviewer-related measurement error in attitudinal research: a nonexperimental study. Quality and Quantity, 25: 151-165.

Esbensen, F.
1983 Measurement error and self-reported delinquency: An examination of interviewer bias. In G.P. Waldo (Ed.), Measurement Issues in Criminal Justice. Beverly Hills: Sage Publications.

Falck, R., Siegal, H.A., Forney, M., Wang, J., and Carlson, R.G.
1992 The validity of injection drug users self-reported use of opiates and cocaine. The Journal of Drug Issues, 22(4): 823-832.

File, K.N., McCahill, T.W., and Savitz, L.D.
1974 Narcotics involvement and female criminality. Addictive Diseases: An International Journal, 1(2): 177-188.

Glanz, L.
1990 Status of the self-report procedure in criminological research. South African Journal of Sociology, 21(2): 96-103.

Gold, M.
1966 Undetected delinquent behavior. Journal of Research in Crime and Delinquency, 3:27-46.

Hawks, R.L. and Chiang, C.N.
1986 Examples of specific drug assays. In Urine Testing for Drugs of Abuse, edited by R.L. Hawks and C.N. Chiang. National Institute on Drug Abuse Research Monograph no. 73. Rockville, Md.: U.S. Department of Health and Human Services, National Institute on Drug Abuse.

Hindelang, M.J., Hirschi, T., and Weis, J.G.
1981 Measuring Delinquency. Beverly Hills: Sage Publications.

Hirschi, T.
1969 Causes of Delinquency. Berkeley: University of California Press.

Hunter, R.J., Marquart, J.W., and Cuvelier, S.J.
1992 The attenuation of "Drug War" efforts in Texas: Public demand vs. state policy. Journal of Crime and Justice, 15(1): 137-156.

Hser, Y. Anglin, D.M., and Chou, C.
1992 Reliability of retrospective self-report by narcotics addicts. Psychological Assessment, 4(2): 207-213.

Johnson, L.D.
1973 Drugs and American Youth. Ann Arbor, MI: Institute for Social Research.

Johnson, L.D., Bachman, J.G., and O'Malley, P.M.
1977 Drug Use Among American High School Students, 1975-1977. Rockville: NIDA.

Johnson, L.D., O'Malley, P.M., and Bachman, J.G.
1984 Drug Use Among American High School Students, 1975-1983. Rockville: NIDA.

Kozel, N.J. and DuPont, R.L.
1977 Criminal charges and drug use patterns of arrestees in the District of Columbia. Rockville, MD: National Institute on Drug Abuse.

Manno, J.E.
1986 Interpretation of urinalysis results. In Urine Testing for Drugs of Abuse, edited by R.L. Hawks and C.N. Chiang. National Institute on Drug Abuse Research Monograph no. 73. Rockville, Md.: U.S. Department of Health and Human Services, National Institute on Drug Abuse.

Marquis, K.H. and Ebener, P.A.
1981 Quality of Prisoner Self-Reports: Arrest and Conviction Response Errors. Santa Monica: Rand Corporation.

Marshall, C.E. and Webb, V.J. with Katz, C.M.
1993 An Exploration into Factors Related to the Desire for Treatment of Substance Abuse: Evidence from Omaha's DUF Program. Presented at the annual meeting of the American Society of Criminology.

McBride, D.C.
1976 The relationship between type of drug use and arrest charge in an arrestee population. In Drug use and crime. Report of the Panel on Drug Use and Criminal Behavior (Appendix). Research Triangle Park, NC: Research Triangle Institute.

Mensch, B.S. and Kandel, D.B.
1988 Underreporting of substance use in a national longitudinal youth cohort. Public Opinion Quarterly, 52, 100-124.

National Institute on Drug Abuse.
1990 National Household Survey of Drug Abuse. Washington D.C.: Government Printing Office.

National Institute of Justice .
1992 Drug Use Forecasting: Annual Report. Washington D.C.: Government Printing Office.

Nurco, D.N.
1985 Issues of validity and population coverage in student surveys of drug use. In Self-Report Methods of Estimating Drug Use, edited by B.A. Rouse, N.J. Kozel, and L.G. Richards. National Institute on Drug Abuse Research Monograph no. 57. Rockville, Md.: U.S. Department of Health and Human Services, National Institute on Drug Abuse.

Nye, F.I. and Short, J.F.
1957 Scaling delinquency behavior. American Sociological Review, 22, 326-331.

O'Malley, P.M., Bachman, J.G. and Johnson, L.D.
1983 Reliability and consistency in self-reports of drug use. International Journal of the Addictions, 18(6): 805-824.

Petersilia, J., Greenwood, P. Lavin M.
1978 Criminal Careers of Habitual Felons. Santa Monica: Rand Corporation.

Reardon, J.A.
1993 The drug use forecasting program: Measuring drug use in a "hidden" population. Washington D.C.: National Institute of Justice.

Regier, G.
1989 (May) Users, like me. Harpers: 51-54.

Reiss, A.J. and Rhodes, A.L.
1961 The distribution of juvenile delinquency in the social class structure. American Sociological Review 26: 720-732.

Rosen, T.H.
1987 Identification of Substance Abusers in the Workplace. Public Personnel Management, 16(3): 197-207.

Rosenfeld, R., Decker, S., Blatner, J., Diamond, P., and Reichard, C.
1993 The Validity of Self-Reported Drug Use: Comparing Time-Bounded and Unbounded Measures for the Individuals and Populations. Presented at the Academy of Criminal Justice Sciences, Kansas City, Missouri.

Rosenfeld, R. and Decker, S.
1993 Discrepant Value, Correlated Measures: Cross-City and Longitudinal Comparisons of Self-Reports and Urine Tests of Cocaine Use Among Arrestees. Journal of Criminal Justice, 21: 223-230.

Skog, O.
1992 The validity of self-reported drug use. British Journal of Addiction, 8(4): 539-548.

Sudman, S. and Bradburn, N.M.
1982 Asking Questions. San Francisco: Jossey-Bass.

Steffensmeier, D. and Allan, E.
1991 Gender, age, and Crime. In J.F. Sheley (eds.), Criminology. Belmont: Wadsworth Publishing Company.

Swartz, J.A.
1990 Cocaine and opiates: Prevalence estimates of their use by arrestees and a theoretical and empirical investigation of their relationship to the commission of violent crimes. Ann Arbor: UMI.

Tonry, M.
1990 Research on drugs and crime. In Crime and Justice: A Review of Research, vol. 13, edited by M. Tonry & J. Wilson. Chicago: The University of Chicago Press.

U.S. Department of the Census.
1991 Statistical Abstract of the United States, (111th edition). Washington D.C.: GPO.

Visher, C.
1991 A comparison of urinalysis technologies for drug testing in criminal justice. Washington D.C.: National Institute of Justice and the Bureau of Justice Assistance.

Weis, J.G.
1986 Issues in the measurement of criminal careers. In A. Blumstein, J. Cohen, J.A. Roth, & C. Visher (eds.), Criminal Careers and "Career Criminals" Vol. 2. Washington, D.C.: National Academy Press.

Williams J.R. and Gold, M.
1972 From delinquent behavior to official delinquency. Social Problems, 20: 209-229

Wish, E.D. and Gropper, B.A.
1990 Drug Testing by the Criminal Justice System: Methods, Research, and Applications. In Crime and Justice: A Review of Research, vol. 13, edited by M. Tonry and J. Wilson. Chicago: The University of Chicago Press.

Wish, E.D. and Johnson L.D.
1986 The impact of substance abuse on criminal careers. In A. Blumstein, J. Cohen, J.A. Roth, & C. Visher (eds.), Criminal Careers and "Career Criminals" Vol. 2. Washington, D.C.: National Academy Press.

Whitehead, P.C. and Smart R.G.
1972 Validity and reliability of self-reported drug use. Canadian Journal of Criminology and Corrections, 14(1): 1-7.

Wolfgang M.E., Figlio, R.M., and Sellin, T.
1972 Delinquency in a Birth Cohort. Chicago, IL: University of Chicago Press.

TABLE 1: Original DUF Coding

Dependent Variables	Original coding	N	%
SR[2] marijuana use in past 72 HRS	3=yes	541	22.5
	99=data not obtained	27	1.1
	.=missing	1519	63.3
	-1=missing	313	13.0
SR cocaine use in past 72 HRS	9=yes	67	2.8
	99=data not obtained	15	.6
	.=missing	1887	78.6
	-1=missing	431	18.0
SR crack use in past 72 HRS	8=yes	83	3.5
	99=data not obtained	8	.3
	.=missing	1889	78.7
	-1=missing	420	17.5
marijuana in urine	1=negative	1711	71.3
	2=positive	689	28.7
cocaine in urine	1=negative	2073	86.4
	2=positive	327	13.6
Independent Variables			
Race	1=black	1083	45.1
	2=white	1091	45.5
	3=spanish speaking	115	4.8
	4=other	68	2.8
	9=data not obtained	43	1.8
Marital Status	1=single	1432	59.7
	2=married	338	14.1
	3=separated, divorced	372	15.5
	4=living common law	243	10.1
	5=widowed	13	.5
	9=data not obtained	2	.1

[2] SR = Self-Report

TABLE 1 Cont.: Original DUF Coding

Independent Variables	Original coding	N	%
Employment	0=welfare/SSI	95	4.0
	1=full-time	1167	48.6
	2=part-time	335	14.0
	3=odd jobs	235	9.8
	4=unemployed	347	14.5
	5=mainly in school	98	4.1
	6=jail or prison	38	1.6
	8=prostitution	1	.0
	9=data not obtained	9	.4
	10=dealing/drug sales	20	.8
	11=illegal sources	17	.7
	12=legal sources	38	1.6
Legal income	median amount of income	$600.00	
Age	median age 27		
Education	1=neither HS grad/GED	676	28.2
	2=HS grad	1114	46.4
	3=currently in HS	137	5.7
	4=GED	468	19.5
	.=missing	5	.2
College	1=no	1712	71.3
	2=yes	535	22.3
	9=data not obtained	125	5.2
	-1=missing	28	1.2
Interviewer sex	1=male	437	18.2
	2=female	1102	45.9
	.=missing	861	35.9
Interviewer race	1=black	165	6.9
	2=white	1278	53.3
	.=missing	957	39.9
Most Serious Charge	1=misdemeanor	1564	65.2
	2=felony	833	34.7
	.=missing	3	.1
Ever inject	1=no	1488	62.0
	2=yes	408	17.0
	9=data not obtained	6	.3
	-1=missing	498	20.8

TABLE 1 Cont.: Original DUF Coding

Independent Variables	Original coding	N	%
Perceived need for treatment	1=no	1773	73.9
	2=yes, drug only	84	3.5
	3=yes, alcohol only	370	15.4
	4=yes, drug/alcohol	173	7.2

TABLE 2: Recoding of Original DUF Coding and New Variables

Dependent Variables	Recodes	N	%
Mj_no_match	0=SR and urine match	1977	82.4
	1=negative SR/positive urine	252	10.5
	2=positive SR/negative urine	171	7.1
Coc_no_match	0=SR and urine match	2139	89.1
	1=SR and urine do not match	261	10.9
Independent Variables			
Race	1=non-White	1266	52.8
	2=white	1091	45.5
	9=missing	43	1.8
Marital status	1=single	1432	59.7
	2=married	966	40.9
	9=missing	2	.1
Employment	1=full-time	1167	48.6
	2=part-time	570	23.8
	4=unemployed	663	27.6
Below poverty line	1=no	1271	53.0
	2=yes	1129	47.0
Age	1=15-20	502	20.9
	2=21-25	581	24.2
	3=26-30	449	18.7
	4=31-35	381	15.9
	5=36+	486	20.3
	9=missing	1	.0
H.S degree or GED	1=no	813	33.9
	2=yes	1582	65.9
	9=missing	5	.2
College	1=no	1712	71.3
	2=yes	535	22.3
	9=missing	153	6.4
Interviewer sex	1=male	437	18.2
	2=female	1102	45.9
	9=missing	861	35.9
Interviewer race	1=non-white	165	6.9
	2=white	1278	53.3
	9=missing	957	39.9

TABLE 2 Cont: Recoding of Original DUF Coding and New Variables

Independent Variables	Recodes	N	%
Most serious charge	1=misdemeanor	1564	65.2
	2=felony	833	34.7
	9=missing	3	.1
Ever inject	1=no	1488	62.0
	2=yes	408	17.0
	9=missing	504	21.0
Perceived need for drug treatment	1=no	2143	89.3
	2=yes	257	10.7

TABLE 3: Frequencies of Variables After the Elimination of Cases with Missing Data (N=1093)

Dependent Variables	Recodes	N	%
Mj_no_match	0=SR and urine match	912	83.4
	1=negative SR/positive urine	94	8.6
	2=positive SR/negative urine	87	8.0
Coc_no_match	0=SR and urine match	965	88.3
	1=SR and urine do not match	128	11.7
Independent Variables			
Race	1=non-White	543	49.7
	2=white	550	50.3
Marital status	1=single	604	55.3
	2=married	489	44.7
Employment	1=full-time	555	50.8
	2=part-time	281	25.7
	4=unemployed	257	23.5
Below poverty line	1=no	627	57.4
	2=yes	466	42.6
Age	1=15-20	170	15.6
	2=21-25	292	26.7
	3=26-30	229	21.0
	4=31-35	189	17.3
	5=36+	213	19.5
H.S degree or GED	1=no	322	29.5
	2=yes	771	70.5
College	1=no	840	76.9
	2=yes	253	23.1
Interviewer sex	1=male	263	24.1
	2=female	830	75.9
Interviewer race	1=non-white	120	11.0
	2=white	973	89.0
Most serious charge	1=misdemeanor	737	67.4
	2=felony	356	32.6
Ever inject	1=no	850	77.8
	2=yes	243	22.2
Perceived need for drug treatment	1=no	940	86.0
	2=yes	153	14.0

TABLE 4: Demographic Characteristics Associated with the Accuracy of Self-Reported Marijuana Use (N=1093)

	Match %	-SR/ +Urine %	+SR/ -Urine %	CHISQ	P-Value
RESPONDENT CHARACTERISTICS					
RACE				.07	.961
Non-White	83.2	8.8	7.9		
White	83.6	8.4	8.0		
Marital Status				4.51	.104
Single	81.3	9.8	8.9		
Married	86.1	7.2	6.7		
Employment				.31	.998
Full-time	84.0	8.5	7.6		
Part-time	82.9	8.9	8.2		
Unemployed	82.9	8.6	8.6		
Below Poverty Line				.73	.691
No	82.6	9.1	8.3		
Yes	84.5	7.9	7.5		
Age				13.97	.082
15-20	85.9	8.2	5.9		
21-25	79.1	10.3	10.6		
26-30	81.2	8.7	10.0		
31-35	83.1	9.5	7.4		
36+	90.1	5.6	4.2		
H.S degree or GED				2.17	.336
No	81.1	9.3	9.6		
Yes	84.4	8.3	7.3		
College				6.31	.042*
No	82.1	8.8	9.0		
Yes	87.7	7.9	4.3		
INTERVIEWER CHARACTERISTICS					
Interviewer Sex				2.15	.341
Male	85.9	6.5	7.6		
Female	82.7	9.3	8.1		
Interviewer Race				1.08	.582
Non-white	84.2	10.0	5.8		
White	83.4	8.4	8.2		

TABLE 4 Cont.: Demographic Characteristics Associated with the Accuracy of Self-Reported Marijuana Use (N=1093).

	Match %	-SR/ +Urine %	+SR/ -Urine %	CHISQ	P-Value
SITUATIONAL FACTORS					
Most Serious Charge				1.03	.594
Misdemeanor	83.6	9.0	7.5		
Felony	83.1	7.9	9.0		
Ever Inject				9.23	.009**
No	84.1	9.2	6.7		
Yes	81.1	6.6	12.3		
Perceived Need for Drug Treatment				36.54	.000***
No	84.1	9.7	6.2		
Yes	79.1	2.0	19.0		

P<.05 =*
P<.01 =**
P<.001 =***

TABLE 5: Demographic Characteristics Associated with the Accuracy of Self-Reported Cocaine Use (N=1093)

	Match %	No Match %	CHISQ	P-Value
RESPONDENT CHARACTERISTICS				
RACE			30.61	.000***
Non-White	82.9	17.1		
White	93.6	6.4		
Marital Status			2.73	.098
Single	89.7	10.3		
Married	86.5	13.5		
Employment			4.61	.099
Full-time	70.1	9.9		
Part-time	85.1	14.9		
Unemployed	87.9	12.1		
Below Poverty Line				
No	88.2	11.8	.01	.913
Yes	88.4	11.6		
Age			3.70	.446
15-20	89.4	10.6		
21-25	90.4	9.6		
26-30	86.9	13.1		
31-35	85.2	14.8		
36+	88.7	11.3		
H.S degree or GED			.02	.883
No	88.5	11.5		
Yes	88.2	11.8		
College			2.18	.139
No	87.5	12.5		
Yes	90.9	9.1		
INTERVIEWER CHARACTERISTICS				
Interviewer Sex			.69	.692
Male	89.0	11.0		
Female	88.1	11.9		
Interviewer Race			.37	.375
Non-white	85.8	14.2		
White	88.6	11.4		

TABLE 5 Cont.: Demographic Characteristics Associated with the Accuracy of Self-Reported Cocaine Use (N=1093).

	Match %	No Match %	CHISQ	P-Value
SITUATIONAL FACTORS				
Most Serious Charge			15.02	.000***
Misdemeanor	90.9	9.1		
Felony	82.9	17.1		
Ever Inject			.64	.422
No	88.7	11.3		
Yes	86.8	13.2		
Perceived Need for Drug Treatment			35.82	.000***
No	90.6	9.4		
Yes	73.9	26.1		

P<.05 =*
P<.01 =**
P<.001 =***

TABLE 6: Demographic Characteristics Associated with the Accuracy of Self-Reported Marijuana Use When the Dependent Variable 'Mj_no_match' is Constructed Dichotomously (N=1093)

	Match %	No Match %	CHISQ	P-Value
RESPONDENT CHARACTERISTICS				
RACE			.03	.860
Non-White	83.2	16.8		
White	83.6	16.4		
Marital Status			4.51	.033*
Single	81.3	18.7		
Married	86.1	13.9		
Employment			.22	.893
Full-time	70.1	9.9		
Part-time	85.1	14.9		
Unemployed	87.9	12.1		
Below Poverty Line			.72	.395
No	82.6	17.4		
Yes	84.5	15.5		
Age			12.45	.014**
15-20	85.9	14.1		
21-25	79.1	20.9		
26-30	81.2	18.8		
31-35	83.1	16.9		
36+	90.1	9.9		
H.S degree or GED			1.87	.170
No	81.1	18.9		
Yes	84.4	15.6		
College			4.41	.035*
No	82.1	17.9		
Yes	87.7	12.3		
INTERVIEWER CHARACTERISTICS				
Interviewer Sex			1.55	.212
Male	85.9	14.1		
Female	82.7	17.3		
Interviewer Race			.05	.820
Non-white	84.2	15.8		
White	83.4	16.6		

TABLE 6 Cont.: Demographic Characteristics Associated with the Accuracy of Self-Reported Marijuana Use When the Dependent Variable 'Mj_no_match' is Constructed Dichotomously (N=1093)

	Match %	No Match %	CHISQ	P-Value
SITUATIONAL FACTORS				
Most Serious Charge			.03	.855
Misdemeanor	83.6	16.4		
Felony	83.1	16.9		
Ever Inject			1.27	.259
No	84.1	15.9		
Yes	81.1	18.9		
Perceived Need for Drug Treatment			2.44	.118
No	84.1	15.9		
Yes	79.1	20.9		

P<.05 =*
P<.01 =**
P<.001 =***

Adult DUF Interview

APPENDIX

100

INTERVIEW DATE ___ ___/___ ___/___ ___ DUF SITE ID# ___ ___ PERSON ID# ___ ___ ___ ___ ___

INFORMATION FROM RECORDS *(Complete Before Approaching Arrestee)*

Year of Birth: ___ ___ SEX: Male–1 Female–2

Ethnicity: B (Not Hispanic) W (Not Hispanic) SS (Hispanic) Other (Am.Indian/Alaskan Nat./Asian/Pacific Islander) SPECIFY:_____

Precinct/location of arrest _____

Was the person charged with a warrant only? No–1 Yes–2

Most serious charge: (NO abbreviations or initials) _____

Arson	01	Family offense	13	Obstructing police/resist arrest	25
Assault	02	Fare beating	14	Probation/parole/ROR violation	26
Bribery	03	Flight/escape/bench warrant	15	Public peace/disturbance/mischief	
Burglary	04	Forgery	16	trespassing/reckless endangerment	27
Burglary tools	05	Fraud	17	Pickpocket/jostling	28
Commercial sex/prostitution	06	Gambling	18	Robbery	29
Damage, destroy property	07	Homicide	19	Sex assault/rape	30
Drug possession	08	Kidnapping	20	Sex offenses	31
Drug sale	09	Larceny/theft	21	Stolen property	32
Embezzlement	10	Liquor	22	Stolen vehicle	33
Extortion/threat	11	Manslaughter	23	Under the influence of cont. substance	34
Weapons	12	Obscenity (e.g.indecent exposure)	24	Other (specify above)	50

Most serious charge Penal Law Code ___ ___ ___ ___ ___ Most Serious Charge: Misdemeanor – 1 Felony – 2 Citation – 3

INFORMED CONSENT DISCUSSED WITH ARRESTEE WHO: *(Circle One)*

Agreed to interview – 1 Declined– 2 Not available (ill, asleep, taken to court)– 3 Other reason not interviewed–4 (Specify)_____

Interviewer's Initials: ___ ___ Interview conducted in: Spanish - 1 English- 2 Other–3

1. How many hours ago were you arrested? _____ hrs. *(If Greater Than 48 Hours Discontinue Interview)*

2. What is the highest grade you completed in school? (0 – 12; Never Attended School = 0) ___ ___

3. Did you graduate from high school or get a GED certificate? *(Circle One)*

Neither	1	Currently in high school	3 ⟶ *(Go to Question 6)*
High school graduate	2	GED	4

4. How many months of technical, trade, or vocational training, other than high school, have you completed? ___ ___

5. Have you attended college? No–1 ⟶ *(Go to Question 6)* Yes–2 ⟶ How many years have you completed? _____

IF COMPLETED ONE OR MORE YEARS OF COLLEGE, ASK: Did you receive: *(Read All Choices, Circle Highest Degree)*

No Degree – 1 AA – 2 BA /BS – 3 Graduate degree – 4 Currently in college *full time* – 5

6. What is your current marital status? *(Read All Choices, Circle One)*:

Single, never married	1	Living with boyfriend/girlfriend	4
Married	2	Widowed	5
Separated, divorced	3		

7. In the past month, how did you mainly support yourself? *(Read All Choices, Circle One. Self-Employed Is Full- Or Part-Time Work)*

Welfare, SSI	0	In jail or prison	6
Working full time ASK A	1	Housewife	7
Working part time ASK A	2	Prostitute	8
Working odd jobs ASK A	3	Dealing/drug sales	10
Unemployed	4	Other – Illegal (SPECIFY) _____	11
Mainly in school	5	Other – Legal (SPECIFY) _____	12

A. IF EMPLOYED, ASK: What kind of job?_____

8. A. In the past month, what was your total income from all legal sources, e.g., wages, food stamps, welfare?___ ___ ___ ___ ___.00

B. In the past month, how much money did you receive from all illegal sources? ___ ___ ___ ___ ___.00

9. Are you now or have you ever received treatment or detox for drug or alcohol use? *(Circle All That Apply)*

Never received treatment	1					
Has received treatment in the past	2 ⟶	What kind?	Drug – 1	Alcohol – 2	Drug and Alcohol – 3	
Currently (now) in treatment	3 ⟶	What kind?	Drug – 1	Alcohol – 2	Drug and Alcohol – 3	

10. Do you feel that you could use treatment for drug or alcohol use?

NO	1				
YES, drug only	2 ⟶	For what drug(s):	Crack – 2	Cocaine – 2	Heroin – 2
YES, alcohol only	3 ↗	PCP – 2	Marijuana – 2	Crystal – 2	Amphetamines – 2
YES, drug and alcohol	4 ↗	Other – 2 (specify) _____			

READ ALOUD: The following questions are somewhat personal but very important to the research. Remember all your answers are confidential.

11. How many different persons have you had sex with in the past year? ___ ___ ___ ___

12. Have you ever tried?	IF YES CIRCLE #	When you first tried (NAME DRUG) how old were you?	In the last 3 days did you use:	# of days used in last month? (NONE = 00)	Have you ever needed or felt dependent on:	IF EVER FELT DEPENDENT ASK: When first dependent, how old were you?	IF EVER FELT DEPENDENT ASK: Are you now dependent on:
Alcohol	1	___ ___	1	___ ___	1	___ ___	1
Tobacco (cigarettes, etc.)	2	___ ___	2	___ ___	2	___ ___	2
Marijuana/hash	3	___ ___	3	___ ___	3	___ ___	3
Inhalants (glue, gas)	4	___ ___	4	___ ___	4	___ ___	4
Mushrooms	5	___ ___	5	___ ___	5	___ ___	5
Black tar heroin	6	___ ___	6	___ ___	6	___ ___	6
Heroin	7	___ ___	7	___ ___	7	___ ___	7
Crack (Rock)	8	___ ___	8	___ ___	8	___ ___	8
Cocaine (Powder)	9	___ ___	9	___ ___	9	___ ___	9
PCP (angel dust)	10	___ ___	10	___ ___	10	___ ___	10
Street Methadone	11	___ ___	11	___ ___	11	___ ___	11
Methadone in trmt.	12	___ ___	12	___ ___	12	___ ___	12
Crystal meth.	13	___ ___	13	___ ___	13	___ ___	13
Amphs., e.g., speed	14	___ ___	14	___ ___	14	___ ___	14
Downers, e.g., barb	15	___ ___	15	___ ___	15	___ ___	15
Valium	16	___ ___	16	___ ___	16	___ ___	16
Quaaludes (ludes)	17	___ ___	17	___ ___	17	___ ___	17
LSD	18	___ ___	18	___ ___	18	___ ___	18
Darvon	19	___ ___	19	___ ___	19	___ ___	19
Dilaudid	20	___ ___	20	___ ___	20	___ ___	20
Designer drugs (e.g., ecstasy,eve, adam, euphoria)	21	___ ___	21	___ ___	21	___ ___	21
ICE (smokeable methamphetamine)	22	___ ___	22	___ ___	22	___ ___	22

Any other drugs: NO – 1 YES – 2 ⟶ SPECIFY _____

13. In the last three (3) days, have you used any drugs, other than those listed above, for medical or nonmedical reasons?

NO – 1 YES – 2 ⟶ SPECIFY _____

14. Are there any new drugs on the street that you have heard are being used? NO – 1 YES – 2
Tell me about them (*Get Street Names, Route of Use, How Sold, Effects, Cost*):

IF THE ARRESTEE REPORTED EVER HAVING TRIED ANY DRUG OTHER THAN ALCOHOL OR TOBACCO, ASK QUESTIONS 15 THRU 20. IF PERSON NEVER TRIED ANY DRUG OR TRIED ONLY ALCOHOL OR TOBACCO, GO TO QUESTION 21.

15. How much money do you spend in an average week for *your* drug use, excluding alcohol or tobacco?
(Note: An average week *refers* to an average week in the last month.) $ ___ ___ ___ ___.00

16. What is your PREFERRED method for using cocaine? (*Circle Only One Number*)

Snort cocaine (powder)	1	Smoke crack (rock cocaine)	6
Freebase cocaine	2	Never used cocaine or crack	7
Smoke cocaine (powder), not crack	3	Used only once or twice	8
Inject cocaine only	4	Other (SPECIFY) _____	10
Inject cocaine with heroin (speedball)	5		

17. Have you ever injected drugs?

NO – 1 ⟶ (Go to Question 21) YES – 2 ASK A

A. IF EVER INJECTED, ASK: How old were you when you first injected? ___ ___ yrs.

B. About how many times have you injected drugs (lifetime)? _____ (9998 = Too many to count)

C. Which of the following drugs have you EVER injected? (*Read Each and Circle All That Apply*):

Heroin - 1 Cocaine - 2 Amphetamines/speed/crystal - 3 Other - 4 (SPECIFY) _____

D. Have you injected any drugs in the last six (6) months? NO - 1 YES - 2

E. Have you ever shared your works/needles?

NO – 1

Why have you never shared? (*Circle One*)

Because of AIDS....1 ⟶ How did you learn about AIDS?
_____
_____
_____

Other reason(s)....2 ⟶ What is the reason(s)?
_____
_____
_____

(Go to Question 21)

YES – 2

How often do you share? (*Read All – Circle One*)

Used to, don't anymore 2
Some of the time 3
Most/all of the time 4

18. When was the last time you shared? ___ ___
(CODE YEAR, e.g., '76, '77)

19. Has AIDS affected your needle sharing? (*Circle One*)

NO – 1 Why has it not affected your sharing?
_____

YES - 2 How has it affected your sharing?
_____

- 3 Stopped injecting due to AIDS

20. Have you shared since you heard about AIDS?

NO - 1 YES - 2

21. Specimen was:

Refused/ did not try – 1 Tried, couldn't urinate – 2 Provided specimen – 3